EFFECTIVENESS OF MUSTARD PLASTER UPON KNEE JOINT PAIN

By

S.DHIVYA

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL 2012

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DECLARATION

I hereby declare that the present dissertation entitled **"Effectiveness of mustard plaster application upon knee joint pain"** is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan,** M.Sc (N)., M.Phil., Ph.D., Principal, Apollo College of Nursing, **Ms.Shobana Gangadharan**, M.Sc (N)., Professor, Community health nursing, Apollo College of Nursing, Chennai. I also declare that the material of this has not formed in any way, the basis for the award of any degree or diploma in this university or any other university.

II Year M.Sc (N) Student

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SYNOPSIS

An Experimental Study to Assess the Effectiveness of Mustard Plaster Application upon knee joint pain Among Elderly Clients in Selected Community, Chennai.

Objectives of the Study

1. To assess the level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.
2. To determine the effectiveness of mustard plaster application by comparing the level of knee joint pain in the control and experimental group of elderly clients.
3. To determine the level of satisfaction in experimental group of elderly clients regarding mustard plaster application.
4. To find the association between levels of knee joint pain and selected demographic variables and clinical variables in control and experimental group of elderly clients.

Conceptual framework of this study was based on Katharine Kolcab theory of comfort which was modified for the present study. An extensive review of literature and guidance by experts laid the foundation for the study. An experimental approach was adopted for the study, which was conducted at selected rural areas in Chennai at Ayanambakkam. The sample size was 60. Simple random sampling technique was chosen where lottering method was used to assign the subjects into control and experimental group.

The investigator used numerical pain rating scale, observational check list for signs and symptoms, rating scale to assess the level of satisfaction to collect data from the elderly clients. The data collection tools were validated and reliability was established. The data collection for the main study was done after determining the feasibility and practicability through pilot study. Mustard plaster (Paste made from 20 gms of mustard powder and 40 gms of wheat flour mixed with needed water, evenly spread in-between cloth) was applied to both the knees over which hot water bag application given for 15 minutes daily for a period of seven days to all the elderly clients with knee joint pain in the experimental group. The collected data were tabulated and analyzed using appropriate descriptive and inferential statistics.

The major findings of the study

- Most of the participants were in the age group of 60-64years (40%, 36.67%), females (53.33%, 76.67%), illiterates (56.67%, 53.33%), married (40%, 40%) and majority of them were non vegetarians (83.33%, 80%), did not have family history of knee joint pain (60%, 70%), heavy workers (50%, 64%) in the control and experimental group respectively.
- Significant percentage of participants have body weight 61-70 kg (46.67%, 46.66%) with BMI >30 (33.33%, 36.67%), have no co morbid illness (43.33%, 40%). Most of them have not taken treatment for co-morbid illness (63.33%, 50%), do not follow any exercise pattern (70%, 56.67%) and majority of them have no history of knee trauma/accidents (80%, 66.67%), not undergone knee surgeries (80%, 76.67%) in the control and experimental group respectively.

- In the control group there was no significant difference in the knee joint pain level before (M = 5.83; SD =1.64) & after (M = 5.20; SD = 1.42), similarly the level of signs and symptoms also showed no difference before (M=4.77; SD= 1.16) & after (M= 3.53; SD = 1.25) mustard plaster application.
- In contrast in the experimental group the knee joint pain level (M=4.17; SD=1.37) & level of signs and symptoms (M=2.27; SD=1.27) after the therapy was low, compared to those before the therapy (M=6.37; SD=1.13) & (M=5.23; SD=2.09) respectively. The difference was found to be statistically significant at $p<0.01$, which attributes to the effectiveness of mustard plaster application.
- Most of the elderly were moderately (60%) satisfied with mustard plaster application and significant percentage (40%) of them were highly satisfied.
- There was no significant association between selected demographic variables and clinical variables and the level of knee joint pain among elderly in both the control and experimental groups respectively.

Recommendations

The same study could be conducted

- On a large sample for a longer duration to generalize the results.
- For age group between 40 -55 years
- To evaluate the effectiveness with other therapies.
- In urban and rural settings as comparative study.
- In different settings among various population groups.

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Chapter I

Introduction

CHAPTER I

INTRODUCTION

Background of the Study

Grow old along with me

The best is yet to be

The last of life, for which the first way made

- Robert Browning

Ageing is the natural process. Old age is a crucial phase where the physiological, psychological and socio-cultural changes take place. It should be considered as a normal, inevitable biological phenomenon. Geriatrics is the medical speciality that deals with the health and social care of the elderly. Gerontology refers to the study of all aspects of the ageing process, including economic, social, clinical and psychological factors, and their effect on the older adult and on society.

The study of the physical and psychological changes, which are incident to old age, is called clinical gerontology. Another aspect of gerontology is social gerontology, which was born on the one hand out of the instincts of humanitarian and social attitude and on the other out of the problems set by increasing number of old people. **Gerontocracy** is government ruled by older people groups such as gray panthers, American association of retired persons (AARP) and national alliance of senior citizens which exerts tremendous political and social influence in the society.

There are currently 580 million elderly all over in the world and of these 355 million live in developed countries; and the life expectancy at birth has increased from

41 years in the early 1950's to 62 years in 1990. In the year 2020, life expectancy has become a health determinant due to the resulting effects made on social life and health care delivery system. There are 81million older people in India, 11 lakh in Delhi itself.

The increase in the elderly population between 1951 and 1991 (38 per cent) was greater than the general population (18.9 per cent). More than four times older persons live in the rural areas of India than in urban areas (Gokhale and Dave, 1994). Ageing is associated with the decline in physiological effectiveness, which affects us all eventually and is an intrinsic part of growing old. However, multiple pathology is a characteristic feature of old age. In Tamil Nadu 60 years and above are 460 in rural and 258 in urban part.

The macabre cost includes heart disease, stroke, cancer, cataracts and knee pain which contributes by adding burden to existing disease pattern .The elderly is not an exemption for this. The community nurse has vital role in prevention of these diseases by modification of life style, food habits, and exercise pattern. The government of India has implemented national policy on older people in (2000-2005) for the elderly welfare. Training programmes are also conducted for health professionals for the elderly care. Help age India is the largest voluntary organisation working for the care of older people.

Based on 2003-05 data from National Health Interview Survey (NHIS), estimated 46 million of people have reported doctor diagnosed knee joint problem and 19 million have attributed activity limitation due to pain. The focus on nursing to the

elderly clients will be on quality of care rendered, in coping signs & symptoms, management of chronic illness, pain management, safety and fall restraints.

Many inflammatory and non- inflammatory conditions like rheumatoid arthritis, gout, osteoarthritis, osteoporosis, obesity, surgical procedures may affect joints. Disorders of the musculo-skeletal system causes considerable morbidity, lead to decreased quality of life and often results in decreased life expectancy. In Tamil Nadu, the most common self reported chronic morbidity among the elderly were chronic joint pain (61.3%).Most of the chronic ill (46%) accessed governmental health services, followed by private practioners (31.4%), 5% accessed health care by village based health clinic of help age programme.(The Hindu ,2011)

In order to manage pain & the functional disability various treatment modalities are used. The pharmacological management varies from administering acetaminophen, NSAID drugs, steroids, to weak opoids. Under one umbrella of non pharmacological measures are rest, joint protection by assistive devices such as cane, weight reduction programme, exercise, external application of oil, heat and cold application. Diet has major role in prevention of joint pain. Practices like intake of calcium, vitamin D and milk, vitamin A, C. magnesium, zinc in green leafy vegetables helps very well.

India being agriculture based country; people over here widely use mustard. They use it starting from cooking to external application. It is available easily and readily. It is naturally occurring plant product which has anti fungal, anti microbial, counter irritant, anticongestant properties. Elderly in our country are not interested to spend more money for their health especially in rural parts. Mustard can be beneficial

to such elderly where they need not to be dependent economically on present generation.

In India only few studies are available for effectiveness of mustard upon knee joint pain which shows less importance is given to this type of problem. Considering all these factors of the elderly and properties of mustard the researcher was interested to investigate the effect of mustard on knee pain among elderly. This evidence can be disseminated and utilized in various care setting to achieve its maximum benefits.

Need for the Study

Older elderly have fewer acute illnesses than younger adults do when older elderly become ill with acute illness, they usually require longer period of recovery and experience more complications than younger people experience. As a normal process of aging, changes occur that slow nerve impulses, lengthen healing time and reduce the body's ability to fend off disease.

The analysis of National health interview survey for 2006 reveals that approximately 30% of population among elderly reported experiencing some type of joint pain. Knee pain was reported by 18% of respondents followed by pain in the shoulder, finger and hip. As far as physical disabilities are concerned, in the rural areas, 5.4 per cent of all the elderly (6.8 per cent females and 4.4 per cent males) are physically disabled while in the urban areas, 5.5 per cent of all the elderly (6.7 per cent females and 4.7 per cent males) are physically disabled. In both rural and urban areas, more females than males are physically disabled (Kholo, 1996).

The most common problem, which largely afflicts the geriatric population, is knee joint pain the increasing number of clients at hospitals and orthopaedic clinic for treatment of knee pain, portrays the true picture of the problem. More than 15% of the nation's population has been gripped due to this. Arthritis of knee is more prevalent in our country where every third person above 55 yrs is affected by it. Due to sedentary habits and consumption of fast food, the percentage of people with knee joint pain has drastically increased. (Times of India).The burden will be greatest in developing countries, where life expectancy is increasing and access to arthoplasty and joint replacement is not readily available (WHO Bulletin 2003).

Pain is a sensation that is caused by stimuli of harmful nature. It is common and distressing manifestation. The standard treatment for knee joint pain has been administration of non steroidal anti inflammatory drugs; they worked well to mask the pain, with its own side effects. Alternative and complementary therapies are increasing in popularity. Patients are seeking alternatives to relieve themselves of their symptoms and to improve their quality of life. Measures to relieve pain are exercise, physiotherapy, splints, reduction, massage, topical therapies.

Ananda (2007) conducted a comparative study to evaluate the effectiveness of hot and cold application on knee pain in Sanjeevini Hospital, Hassan .Non-probability sampling approach were used. The study revealed hot application is 15% effective than cold application.

An experimental study was conducted by Vinodini to determine the effectiveness of infra red therapy upon knee joint pain among elderly in old age home

at Chennai (2010), the study revealed that the therapy showed effectiveness in pain reduction and majority of elderly (93.3%) had high satisfaction with regard to this intervention.

Mustard is an easily available and comparatively cheap material. Mustard is well known for its counter irritant, anti-congestant property. It has antifungal and anti microbial activity. Substance in mustard is allyl-isothiocyanates. Isothocyanates can inhibit carcinogenesis in breast, colon and lung (journal of traditional knowledge 2009). Practices have proven that it increases circulation and reduces pain at application site. (Holistic online.com). Improvements were made on mustard plaster by adding egg white rather than water to minimize irritation for those with sensitive skin (John K.D 2008). Mustard application works primarily through chemical action and secondarily by the action of heat. It reduces the muscle stiffness. They will improve the quality of life for people with knee pain and their families. Synclair has demonstrated clinical application of mustard plaster for joint pain relief in frozen shoulder. In her book of hydrotherapy she has indicated the use for knee joint pain.

Now a days the young generation migrate to distant places for job, to establish their households at their work place. Sometimes they take the elderly along with them but in most cases, the aged are left behind and sometimes they are even left as destitute. The community health nurse has great part in caring such elderly; especially with those suffering from pain. Mustard can be very well used by community nurse during their home visit.

Due to its country wide presence, easy availability, affordability and safety, mustard is best choice. Hence the researcher was interested in using mustard as plaster in her intervention to reduce knee joint pain among elderly thus improving the quality of life.

Statement of the Problem

An Experimental Study to assess the Effectiveness of Mustard Plaster Application upon Knee Joint Pain among Elderly Clients in Selected Community, Chennai.

Objectives of the Study

5. To assess the level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.
6. To determine the effectiveness of mustard plaster application by comparing the level of knee joint pain in control and experimental group of elderly clients.
7. To determine the level of satisfaction in experimental group of elderly clients regarding application of mustard plaster.
8. To find the association between the selected demographic variables and clinical variables and the level of knee joint pain in control and experimental group of elderly clients.

Operational Definitions

Effectiveness

In this study it refers to outcome of mustard plaster application measured by investigator in terms of significant reduction in knee joint pain level as determined by the difference between pain score level.

Knee joint pain

In this study it refers to intensity of Pain in knee joint experienced and verbalized by elderly which was assessed by numerical pain rating scale.

Elderly Clients

In this study it refers to people at the age of 60 years and above.

Mustard plaster application

In this study it refers to paste made from 20gms of mustard powder and 40 gms of wheat flour mixed with needed water, evenly spread in-between a cloth over which hot water bag application (110^0F) given for 15 minutes for a period of seven days.

Assumptions

- Elderly are at risk of developing knee joint pain
- Knee joint pain is a common problem after the age of 40 years
- Mustard contains allyl iso thiocyanate, an anti congestant by property which reduces pain.

Null Hypotheses

Ho_1: There will be no significant difference in the level of knee joint pain before and after mustard plaster application between control and experimental group of elderly clients.

Ho_2: There will be no significant association between selected demographic variables and level of knee joint pain in control and experimental group of elderly clients.

Ho_3: There will be no significant association between selected clinical variables and level of knee joint pain in control and experimental group of elderly clients.

Delimitations

The study was limited to

- Elderly clients with knee joint pain.
- 4 weeks duration.

Conceptual Frame Work

The conceptual framework for research study presents the reasoning on which the purposes of study are based. The frame work presents the perspective from which the investigator views the inter related concepts that are assessable together in some rational schemes by virtue of their relevance to a common theme (Polit and Beck, 2010).The conceptual frame work for the present study was based on **Katharine kolcab** theory of comfort

Health care needs

Health care needs are those identified by the family and patient in a particular setting. In this study, the clients identify their health needs such as pain, restricted range of motion; stiffness of the joint which has to be taken care by the community health nurse.

Comforting interventions

Comfort measures are the interventions that the nurse design and implement to meet the health care needs. The intervention has the explicit goal of enhancing the patient's comfort or facilitating subsequent desirable health seeking behaviour. In this study, the comforting nursing intervention carried out by the nurse is the application of mustard plaster for 7 days.

Intervening variables

Intervening variables are those factors that are not likely to change and over which the health care provider has little control. In this study the variables such as age, sex, family history of knee joint pain are considered as intervening variables.

Comfort

The immediate experience of being strengthened through having the needs for relief, ease or transcendence met in the physical, psychosocial, spiritual, environmental and social contexts of experience. The intentional comforting actions of the nurse in this study is to strengthen the clients by alleviating pain, joint stiffness, improving the

range of motion and activities of daily living that the clients will have either relief or any of the comfort need will be met.

Enhanced comfort

According to comfort theory, enhanced comfort is an immediate desirable outcome of nursing care, comfort intervention over time; enhances comfort with health seeking behaviour. In this study after 7 days of intervention the clients comfort had decreased intensity of pain, joint stiffness and improved range of motion.

Health seeking behaviours

Internal or external behaviours in which the patient engages that facilitate health or a peaceful death. In this study the health seeking behaviour i.e.; the desirable outcome can be either internal such as repair of unhealthy cartilage, psychological status such as level of satisfaction with mustard plaster application and externally the client's involvement in day to day activities.

Institutional integrity

It is defined as the values, financial stability & the wholeness of health care organizations. Best policies are the protocols and procedures developed by an institution for overall use after collecting evidence. Best practices are those protocols and procedure developed by an institution for specific patient after collecting evidence.

Here, the institution integrates mustard plaster application as a part of therapy for knee joint pain in the hamlets covered by community health nursing department.

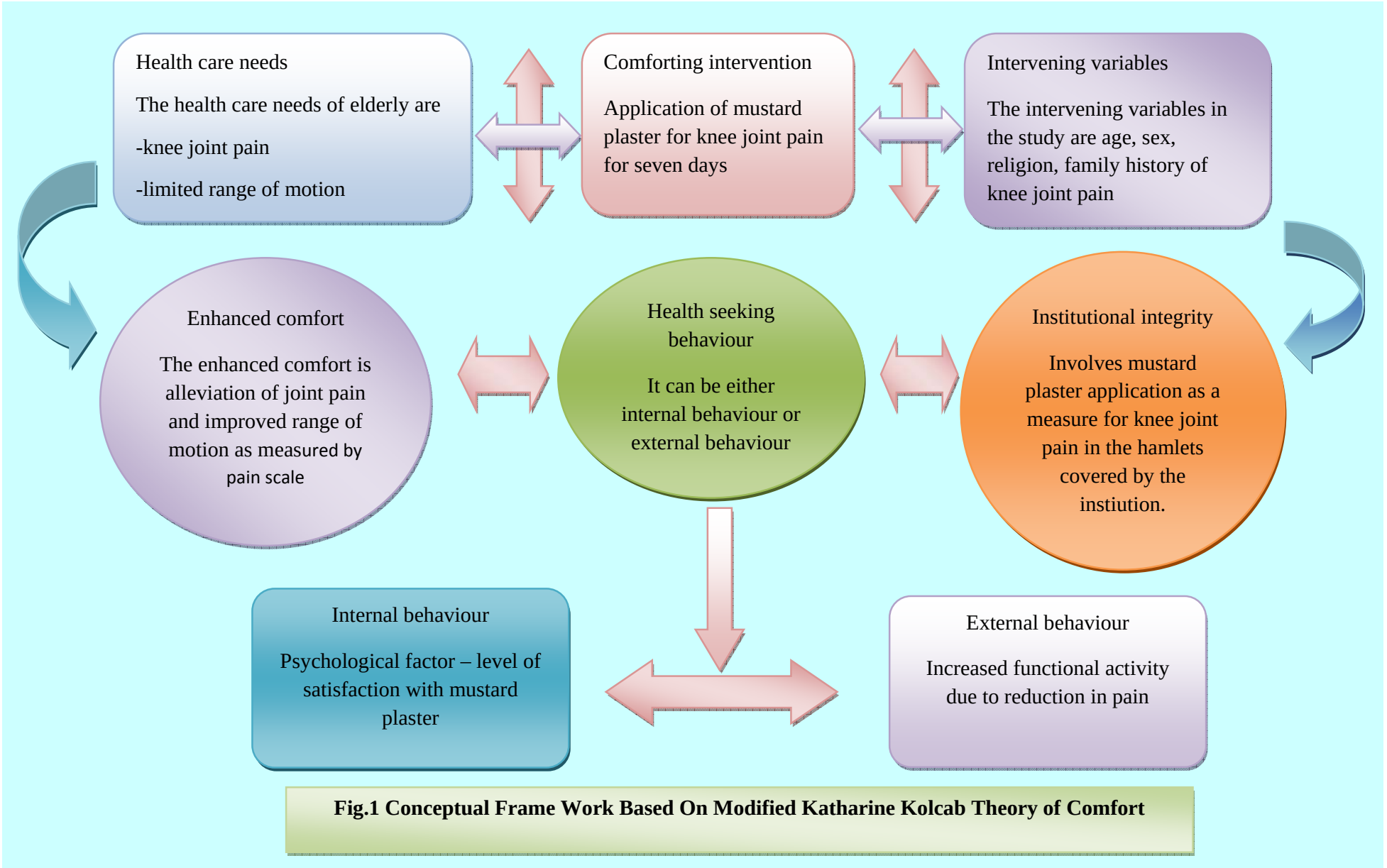

Fig.1 Conceptual Frame Work Based On Modified Katharine Kolcab Theory of Comfort

Projected Outcome

The outcome of the study was decrease in the level of knee joint pain among elderly clients in the experimental group after mustard plaster application.

Summary

This chapter deals with the background of the study, need for the study, statement of the problem, objectives, operational definition, assumptions, null hypotheses, delimitations and conceptual frame work.

Organisation of the Report

Further aspects of the study are presented in the following five chapters

In Chapter – II	Review of literature
In Chapter – III	Research methodology, which includes research approach, design, setting, population, sample and sampling techniques, tool description, content validity, and reliability of tools, pilot study, data collection procedure and plan for data analysis.
In Chapter – IV	Analysis and discussion
In Chapter - V	Discussion
In Chapter – VI	Summary, Conclusion, implications and recommendation

Chapter II

Review of literature

CHAPTER II

REVIEW OF LITERATURE

A literature review involves the systematic identification, location, and summary of writer's material that contain information on a research problem. (Polit and Beck 2010).

Review of Literature is a key step in researcher process. It refers to extensive, exhaustive and systematic examination of publication relevant to research topic.

This chapter deals with a review of published and unpublished research studies from related material. For the present study, the review helped the investigator to develop an insight into the problem area. This helped the investigator in building the foundation of the study.

The review of literature is presented under the following headings.

- Literature related to knee pain.
- Literature related to pharmacological and non-pharmacological treatment for knee pain.
- Literature related to effectiveness of mustard plaster application on knee joint pain

Literature Related to Knee pain

In 2008 a descriptive study, has been done by Gopal et.al, among 200 elderly in rural and urban areas of Chandigarh in Haryana. They observed that about 87.5% had

minimal to severe disability. The most prevalent morbidity was osteoarthritis, followed by dental problem, anemia, cataract, and hypertension.

A semi structured interview of older adults (2007) with knee pain was conducted by Porchret to assess their use of 26 interventions for knee pain in England, study participants were 201.The result concluded that majority of older people only seeked health clinics instead using exercise, weight loss which was main reason for knee pain.

Palmer (2007) investigated whether knee pain in the community behaves like a regional pain syndrome, determined by its association with mental health, self-rated health (SRH) and beliefs about prognosis. An 18-month postal follow-up was conducted in 1798 working-aged subjects, sampled from the community. The 1256 participants (70% response) comprised 468 with knee pain at baseline and 788 without. Among the former, 49% had persistent knee pain at follow-up, while among the latter, 15% reported new symptoms. Incident prescription-treated knee pain was strongly associated with all of the mental health variables and with SRH. The findings were that knee pain in the community shares risk factors in common with other non-specific regional pain syndromes.

A prospective epidemiological trial was conducted by Jack (2007) on Self-Efficacy and the Progression of Functional Limitations and Self-Reported Disability in Older Adults with Knee Pain and difficulty with daily activity were followed for 30 months. There was a significant interaction of baseline self-efficacy with baseline knee strength in predicting both self-reported disability and stair climb performance.

In Michigan, (2006) a cross sectional study was conducted among elderly in an old age home. It is found that 118 cases of elders were suffering with knee joint pain. The risk factors were overweight, nutritional deficiency etc and was associated with repair of tissues in the knee joint.

The analysis of National health interview survey for 2006 reveals that approximately 30% of population among elderly reported experiencing some type of joint pain. Knee pain was reported by 18% of respondents followed by pain in the shoulder, finger and hip.

Osteoarthritis is equally prevalent in men and women aged 45-55 years, after age 45, the prevalence of osteoarthritis increases in women in comparison with men. The primary difference in incidence between male and female are related to the sites affected by osteoarthritis. The most common sites affected in females are distal interphalangeal joints, hips (in those aged 55-64), and knees (in those aged 65-74).in males aged 65-74 years, the hips and knees are affected than they are in females.

McCarne et.al. (2000) conducted a study about Knee pain and osteoarthritis in older adults. The study revealed that during a one year period 25% of people over 55 years have a persistent episode of knee pain, of whom about one in six in the UK and the Netherlands consult their general practitioner. The prevalence of painful disabling knee osteoarthritis in people over 55 years is 10%, of whom one quarter are severely disabled Healthcare provision in primary care needs to focus on this broader group to impact on community levels of pain and disability.

Studies Related to Pharmacological and Non-pharmacological Treatment for Knee Pain

A study was conducted to assess the effectiveness of camphor oil in reduction of pain in arthritis by Vijayalakshmi (2011) at pathanamthitta district, kerala.30 samples in experimental and 30 in control group. The mean of experimental group were compared against the mean of control group. The t value revealed highly significant at $p<0.01$ level.

Fredrick (2009) conducted the study to determine the effectiveness of mud therapy for 57 patients with bilateral primary knee pain, 32 of the patient received daily mud pack treatment on weekdays only for 3 weeks. The mud pack treatment was applied to both the knees for 30 minutes at $45^{o}C$, the remaining 25 patients, serving as control group, were given acetaminophen (2g/day). The results suggested that mudpack treatment significantly reduced the level of pain and improved functional status of patient with knee joint pain.

Non-probability sampling approach was used in a comparative study conducted by Ananda in 2007 to evaluate the effectiveness of hot and cold application on knee pain in Sanjeevini Hospital, Hassan. The study revealed hot application is 15% effective than cold application.

Andreas et.al conducted a randomised controlled trial to evaluate the effectiveness of leech therapy for symptomatic relief of osteoarthritis of knee.51 patients were selected, one group was receiving leech therapy with 4 to 6 locally applied leeches another group received a 28 day topical diclofenac regimen. The result

showed that leech therapy had significant reduction of symptom like stiffness, difference of function compared to diclofenac regimen.

An experimental study conducted by Lerman (2006) to determine the efficacy of chiropractic manual flexion and hot pack application for the treatment of knee joint pain. 252 patients were included in treatment .The results concluded that the chiropractic manual flexion combined with heat is more effective for knee joint pain.

In 2006 (Spain), a study was conducted by Scharf to assess the role of acupuncture in osteoarthritis knee pain where total of 88 patients with osteoarthritis were randomly divided into two groups, one receiving acupuncture and the other placebo. Acupuncture treatment lasted for 12 weeks and the findings showed that the acupuncture group had a greater reduction in pain, stiffness, improved physical function and quality of life than the placebo group.

Jordan (2003) conducted a systematic review and meta-analysis of randomized controlled trials to evaluate the effect of acupuncture on pain and function in patient with chronic knee pain. 13 randomised control trails were included, of which 8 were adequate acupuncture and provided WOMAC outcomes, which were combined in metaanalysis. The findings were significantly superior to acupuncture.

Studies Related to Mustard Application on Knee Joint Pain

A study was conducted at kayalvarath health complex in 2010 to determine the effectiveness of mustard plaster in reducing the knee joint pain. The study group consist

of 60 clients. Mustard plaster was applied and hot water application given. Post procedural pain score indicated a significant reduction in joint pain among client.

In 2004 study conducted by Joredt et al. found that topical application of mustard oil (allyl –iso thiocyanate) to skin activates underlying sensory nerve ending, thereby producing pain, inflammation and hypersensitive to thermal and mechanical stimuli. Mustard oil depolarizes a sub population of primary sensory neurons. This finding identifies a cellular and molecular target for pungent action for mustard oils and supports an emerging role for TRP channels as iono tropic cannabinoid receptors.

Edward et al. in 1993 tried successfully mustard as a topical treatment for arthritis. The study group contained 90 arthritis clients. Mustard was applied over painful joint and massaged. The post procedural pain scores indicated a significant reduction in joint pain among participants.

Summary

This chapter has dealt with review of literature to the problem stated. The literatures presented here were extracted from 14 primary and 4 secondary sources. It has helped the researcher to understand the impact of problem under study. It has also enabled to develop the tool and plan the data collection procedure and to analyse the data.

Chapter III

Research Methodology

CHAPTER III

RESEARCH METHODOLOGY

Methodology is a systematic way to solve the research problems. The research methodology involves the systematic procedure by which the investigator starts from initial identification to conclusion.

The present study was conducted to assess the effectiveness of mustard plaster on knee joint pain among elderly clients. It deals in brief the different steps under taken by the investigator for the study. It involves research approach, the setting, population, and sample, sampling technique, selection of tool, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

Research Approach

Research approach is the most significant part of any research. The appropriate choice of the researcher approach depends on the purpose of the research study which is under taken.

According to Polit and Beck (2010) experimental research is one in which the researcher controls the independent variables and randomly assign subjects to different conditions. An experimental research is to determine the extent to which a given treatment meets the desired results. To accomplish the objective of this study, an experimental approach was considered most appropriate, since the researcher wanted to assess the effect of mustard plaster application upon knee joint pain

Research Design

A research design is the most important methodological design that a researcher works in conducting a research study. True experimental research design was adopted for conducting the study. It fulfils the criteria such as randomisation, manipulation and control.

R O1 - O2

R O1 X O2

R – Randomisation

O1 – Assessment of pain before mustard plaster application

O2 – Assessment of pain after mustard plaster application

X - Mustard plaster application once a day for 15 minutes for 7 days

Variables

Independent variable - Application of mustard plaster

Intervention

Paste made from 20 gms of mustard powder and 40 gms of wheat flour mixed with needed water, evenly spread in-between a cloth over which hot water bag application (110^0F) given for 15 minutes for a period of seven days.

Dependent variable - The level of knee joint pain among elderly clients before and after mustard plaster application.

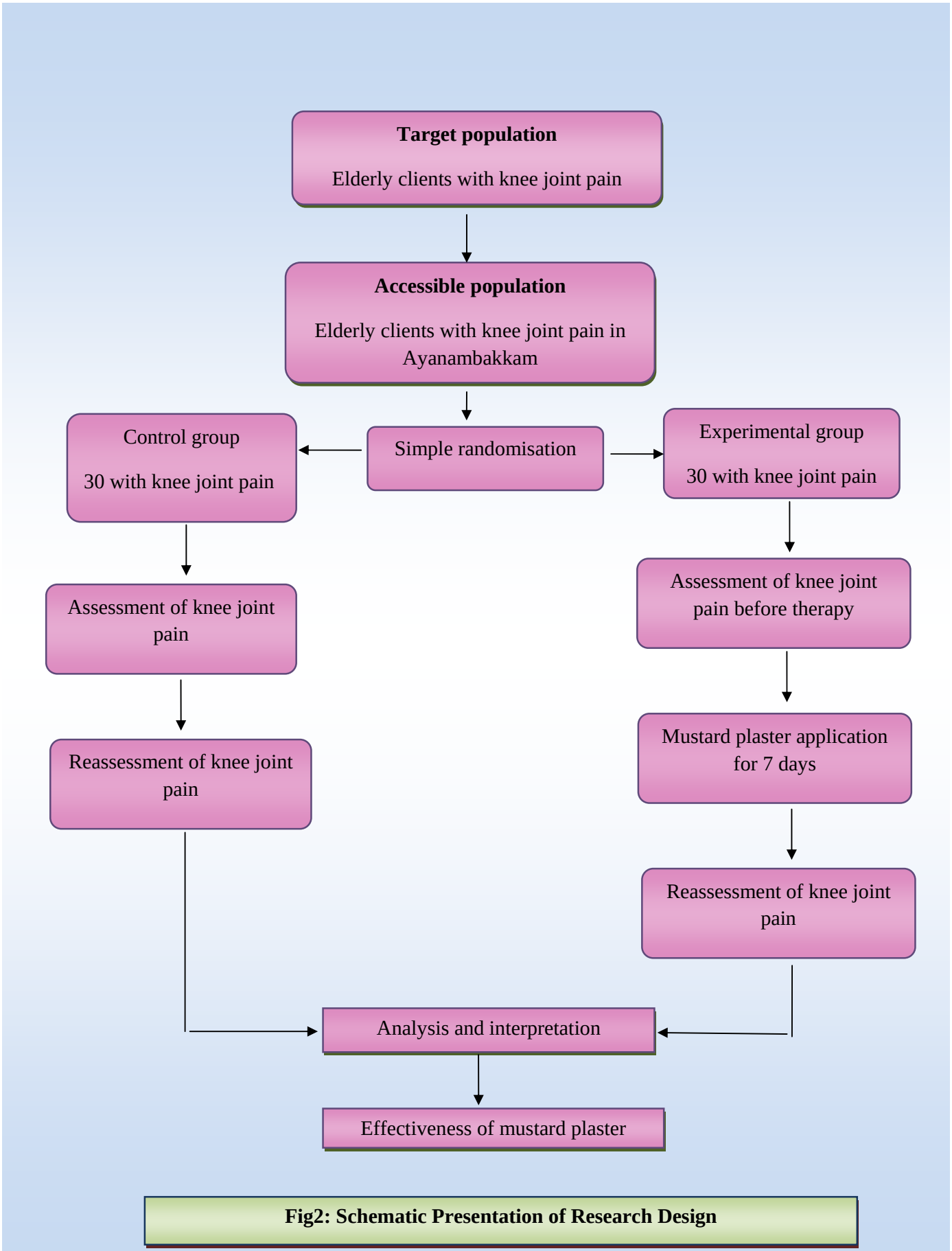

Fig2: Schematic Presentation of Research Design

Research Setting

Settings are the most specific places where data collection will occur (polit and beck 2006).The present study was conducted at Ayanambakkam, Chennai. Ayanambakkam is a rural area belonging to Ambattur Taluk, Thiruvallur District. Melayanambakkam, (experimental group) and Keelayanambakkam (Control group).

Population

Population is the entire aggregation of cases which meet designed set of criteria (Polit & beck 2010)

Target Population

The group of population that the researcher aims to study and to whom the study findings will be generalised. In this study the target population comprises of elderly above 60 years who have knee joint pain.

Accessible Population

The list of population that the researchers find in the study area. The accessible population in this study were elderly clients with knee joint pain in Melayanambakkam and Keelayanambakkam.

Sample and Sample Size

Sample consists of the Subset of units that comprises the population.

A sample of 60 clients with knee joint pain from Ayanambakkam were selected for the study for which 30 clients were randomly assigned to control group and 30 client to experimental group.

Sampling Technique

Sampling is the process of selecting a portion of population to represent the entire population (Polit & Beck 2010)**.**

Simple random sampling was used in this study to select the elderly clients. In the lottery method 60 elderly clients number were written in the paper and put into box. The researcher selected the subjects by providing equal chance to all the participants. The outcome of the lottery method first 30 subjects were assigned to control and remaining 30 subjects were chosen as experimental group.

Sampling Criteria

Inclusion Criteria

The study includes elderly clients who

- Can speak and understand Tamil.
- Are available at the time of data collection
- Are 60 years and above

Exclusion Criteria

The study excludes elderly clients who

- Are not residing in the selected community
- Are not willing to participate in the study.

Selection and Development of Study Instruments

As the study aimed to evaluate the effectiveness of mustard plaster application upon knee joint pain among elderly clients, the data collection instruments were developed through an extensive review of literature in consultation with experts and with the opinion of faculty members. The instruments used in this study are demographic variables, clinical variables, observational checklist, numerical pain rating scale. and rating scale to assess the level of satisfaction regarding mustard plaster application.

Demographic variable proforma of elderly clients with knee joint pain

This proforma is used to measure the demographic variables such as age, sex, education level, marital status, dietary pattern, religion, family history, occupation.

Clinical variable proforma of elderly clients with knee joint pain

This proforma is used to assess the clinical variables such as height , weight, BMI, co-morbid illness, exercise pattern of client, treatment pattern for co- morbid illness.

Numerical pain rating scale

The numeric pain rating scale is used to assess the level of pain experienced by the elderly clients. The rating ranges from no pain to severe pain (0 – 10).

Observational checklist to assess the signs and symptoms related to knee joint pain

This checklist is designed to assess the signs and symptoms related to knee joint pain of elderly before and after treatment. The scoring is classified into two levels.

Yes - 1

No - 0

Level of signs and symptoms	**Score interpretation**
Mild	1-3
Moderate	4-6
Severe	7-10

Rating scale to assess the level of satisfaction in experimental group regarding mustard plaster application.

To assess the level of satisfaction in experimental group regarding mustard plaster application and its effectiveness. Scoring were given maximum 4 (highly satisfied) to 1 (highly dissatisfied)

Scores	**Percentage**	**level of satisfaction**
31- 40	76-100%	Highly satisfied
20- 30	50-75%	Satisfied
11- 19	25-49%	Dissatisfied
>10	below 25%	Highly Dissatisfied

Psychometric Properties of the Study Instruments

Content validity

The degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain. The content validity was obtained from the experts among whom one were doctor and five were nurses.

Pain Intensity Scale

The reliability of pain intensity scale was found by inter rater technique and it was 0.9 and found highly reliable by Pearson's correlation.

Observational Check List on Signs and Symptoms of knee joint pain

The reliability of observational check list on signs and symptoms was found by test-retest method and it was 0.8 and found reliable.

Rating Scale to Assess the Level of Satisfaction Regarding Mustard Plaster Application

The reliability was assessed through spilt half method and found to be 0.9 and content validity was obtained.

Pilot Study

Pilot study is a miniature version of the actual study in which the instruments were administered to the subjects drawn from the population. It is a small version or trial run, done in preparation for the major study. The pilot study was conducted with

the set of small sample of 10 elderly in Rajankuppam with knee joint pain. Pilot study revealed that the present study is feasible to conduct.

Protection of Human Rights

The study was conducted after getting the approval from ethical committee of Apollo Hospitals, Chennai. Permission from Principal, HOD of Community Nursing Department, Apollo College of Nursing. Consent obtained from participants and confidentiality maintained throughout study

Data collection procedure

Data collection was the gathering of information needed to address a research problem. The data was collected from June 2011 to July 2011.Permission was obtained from the area counsellor before conducting study. The study was primarily concerned to assess the effectiveness of mustard plaster upon knee joint pain among elderly clients. The investigator used numerical pain rating scale, observational check list of signs and symptoms, rating scale to assess the level of satisfaction to collect data from the elderly clients. The data collection tools were validated and reliability was established. The data collection for the main study was done after determining the feasibility and practicability through pilot study. Mustard plaster (Paste made from 20 gms of mustard powder and 40 gms of wheat flour mixed with needed water, evenly spread in-between a cloth) applied to both the knees over which hot water bag application given for 15 minutes daily morning for a period of seven days to all the elderly clients with knee joint pain in the experimental group. After 7 days, the level of

knee joint pain was assessed for both control and experimental group. The level of satisfaction was assessed for experimental group using rating scale.

Problems faced during data collection

- The elderly were in need of more explanation about intervention.
- The researcher need to spend more time to go door to door.

Plan for data analysis

Data analysis is the systematic organization & synthesis of research data and testing of research hypotheses by using the obtained data (Polit & Beck, 2004). Analysis and interpretation are carried out with descriptive and inferential statistics. Descriptive statistics like frequency distribution, percentage, mean standard deviation and inferential statistics like t – test and chi –square test were used to analyze the data.

Summary

This chapter deals with the researcher approach, researcher design, setting, population, sample, sampling criteria, selection and development of study instrument, validity and reliability of study instruments, pilot study, data collection procedure and plan for data analysis.

Chapter IV

Analysis and Interpretation

CHAPTER IV

ANALYSIS AND INTERPRETATION

The analysis is defined as the method of organising data in such a way that the research question can be answered. Interpretation is the process of making sense of results and examining the simplification of the findings with in a broader context.

This chapter includes both descriptive and inferential statistics. Statistics is a field of study concerned with technique or method of collection of data, classification, summarising, interpretation, drawing inferences, testing of hypothesis etc.

The data were analysed according to the objective and hypotheses of the study. Analysis of data was done after all the data were transferred to master data sheet.

Organisation of Findings

The findings of the study were organised and presented under the following headings.

- Frequency and percentage distribution of demographic variables in control and experimental group of elderly clients with knee joint pain
- Frequency and percentage distribution of clinical variables in control and experimental group of elderly clients with knee joint pain.
- Frequency and percentage distribution of level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.

- Frequency and percentage distribution of selected signs and symptoms of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.
- Comparison of mean and standard deviation of level of knee joint pain between control and experimental group before and after mustard plaster application of elderly clients.
- Comparison of mean and standard deviation of knee joint pain signs and symptoms between control and experimental group before and after mustard plaster application of elderly clients.
- Domain Wise Frequency and percentage distribution of the level of satisfaction regarding mustard plaster application in experimental group of elderly clients.
- Association between selected demographic variables and level of knee joint pain before and after mustard plaster application in the control and experimental group of elderly clients.
- Association between selected clinical variables and level of knee joint pain before and after mustard plaster application in the control and experimental group of elderly clients.

Table 1

Frequency and Percentage Distribution of Demographic Variables in Control and Experimental Group of Elderly Clients with Knee Joint Pain.

Demographic Variables	Control group n=30		Experimental group n=30	
	n	p	n	p
Age in years				
60 - 64	12	40	11	36.67
65 - 70	10	33.33	12	40
71 - 75	8	26.67	7	23.33
Sex				
Male	14	46.67	7	23.33
Female	16	53.33	23	76.67
Educational Status				
Illiterate	17	56.67	16	53.33
Elementary / Middle school	13	43.33	14	46.67
Marital status				
Married	12	40	12	40
Single	0	0	2	6.67
Divorced	0	0	0	0
Widow/Widower	18	60	16	53.33

Dietary pattern				
Vegetarian	5	16.67	5	16.67
Non vegetarian	25	83.33	24	80
Ova vegetarian	0	0	1	3.33
Previous Occupation				
Heavy Worker	18	60	15	50
Moderate Worker	12	40	15	50
Family History of knee joint pain				
Yes	12	40	9	30
No	18	60	21	70

Data in the Table 1 shows that most of the participants were in the age group of 60-64years (40%, 36.67%), females (53.33%, 76.67%), illiterates (56.67%, 53.33%), married (40%, 40%) and majority of them were non vegetarians (83.33%, 80%), did not have family history of knee joint pain (60%, 70%), heavy workers (50%, 64%) in the control and experimental group respectively.

Figure: 3 illustrates that 80% and 46.67% in the control and experimental group were Christians.

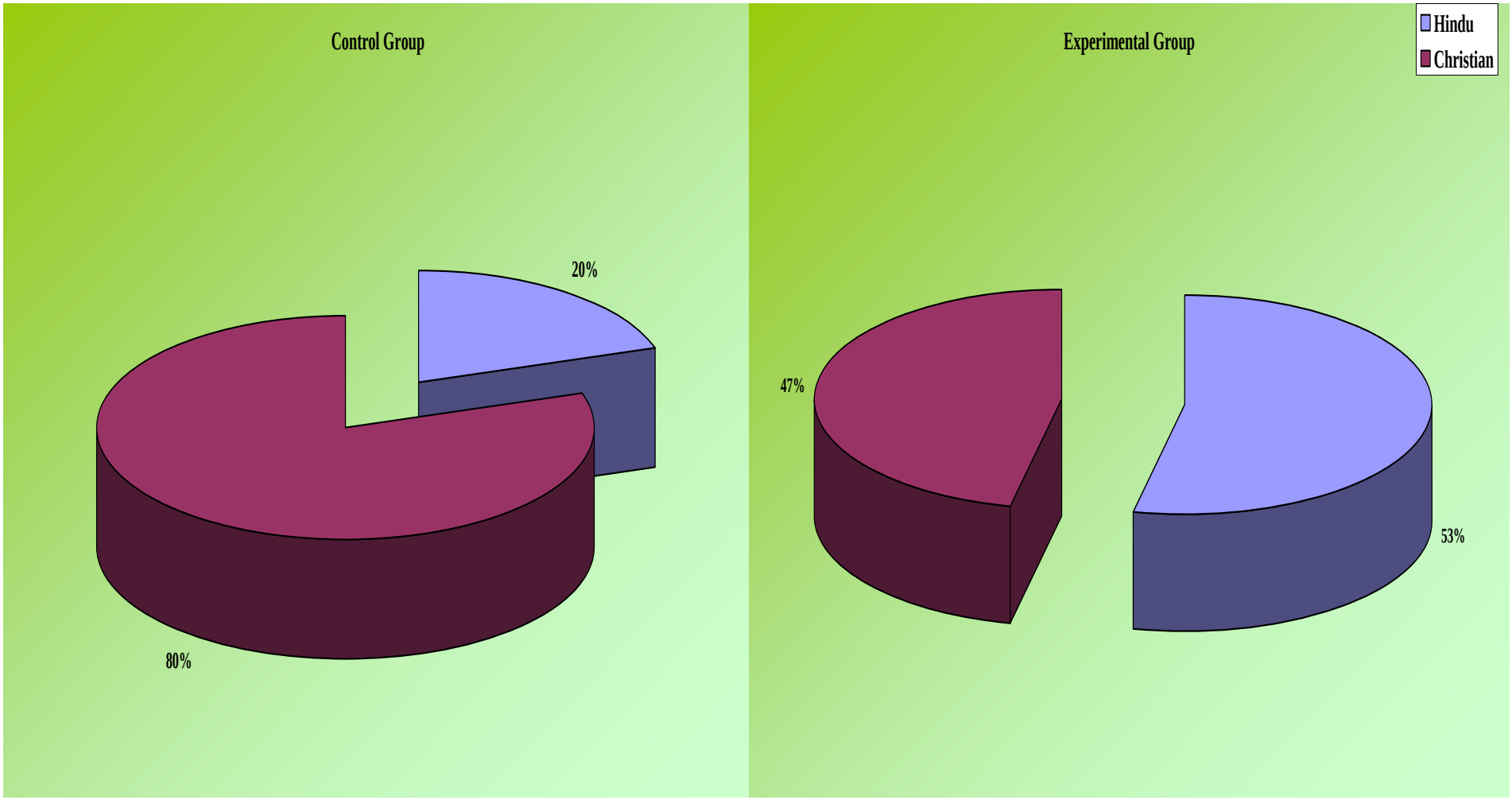

Fig. 3 Percentage Distribution of Religion in Control and Experimental Group of Elderly Clients

Table 2

Frequency and Percentage Distribution of Clinical variables in the Control and Experimental Group of Elderly clients with Knee Joint Pain.

Clinical Variables	Control group n=30		Experimental Group n=30	
	n	p	n	p
Weight in Kg				
<50	0	0	4	13.33
51 - 60	9	30	5	16.67
61 - 70	14	46.67	14	46.67
>70	7	23.33	7	23.33
Body Mass Index				
<18.5	0	0	1	3.33
18.6 - 24.9	8	26.67	9	30
25 - 29.9	12	40	9	30
>30 kg	10	33.33	11	36.67
Presence of co morbid illness				
Hypertension	6	20	9	30
Cardiovascular disease	1	3.33	0	0
Diabetic Mellitus	10	33.33	9	30
Nil	13	43.33	12	40
Treatment of co morbid illness				
Yes	11	36.67	15	50
No	19	63.33	15	50
Following regular exercise				
Walking	12	40	9	30
Cycling	1	3.3	-	-
none	17	56.67	21	70

Recent	0	0	2	6.67
Past	6	20	8	26.67
Not at all	24	80	20	66.67
Undergone Surgeries				
Yes	6	20	7	23.33
No	24	80	23	76.67

In the present study significant percentage of participants have body weight 61-70 kg (46.67%, 46.66%) with BMI >30 (33.33%, 36.67%), have no co morbid illness (43.33%, 40%). Most of them have not take treatment for co-morbid illness (63.33%, 50%), do not follow any exercise pattern (70%, 56.67%) and majority of them have no history of knee trauma/accidents (80%, 66.67%), not undergone knee surgeries (80%, 76.67%) in the control and experimental group respectively.

Figure: 4 reveal that 50% and 26.67% of participants were between 151-160 cm in control and experimental group respectively.

Figure: 5 represents that 23.33% and 33.33% of participants were using oral analgesic for knee joint pain.

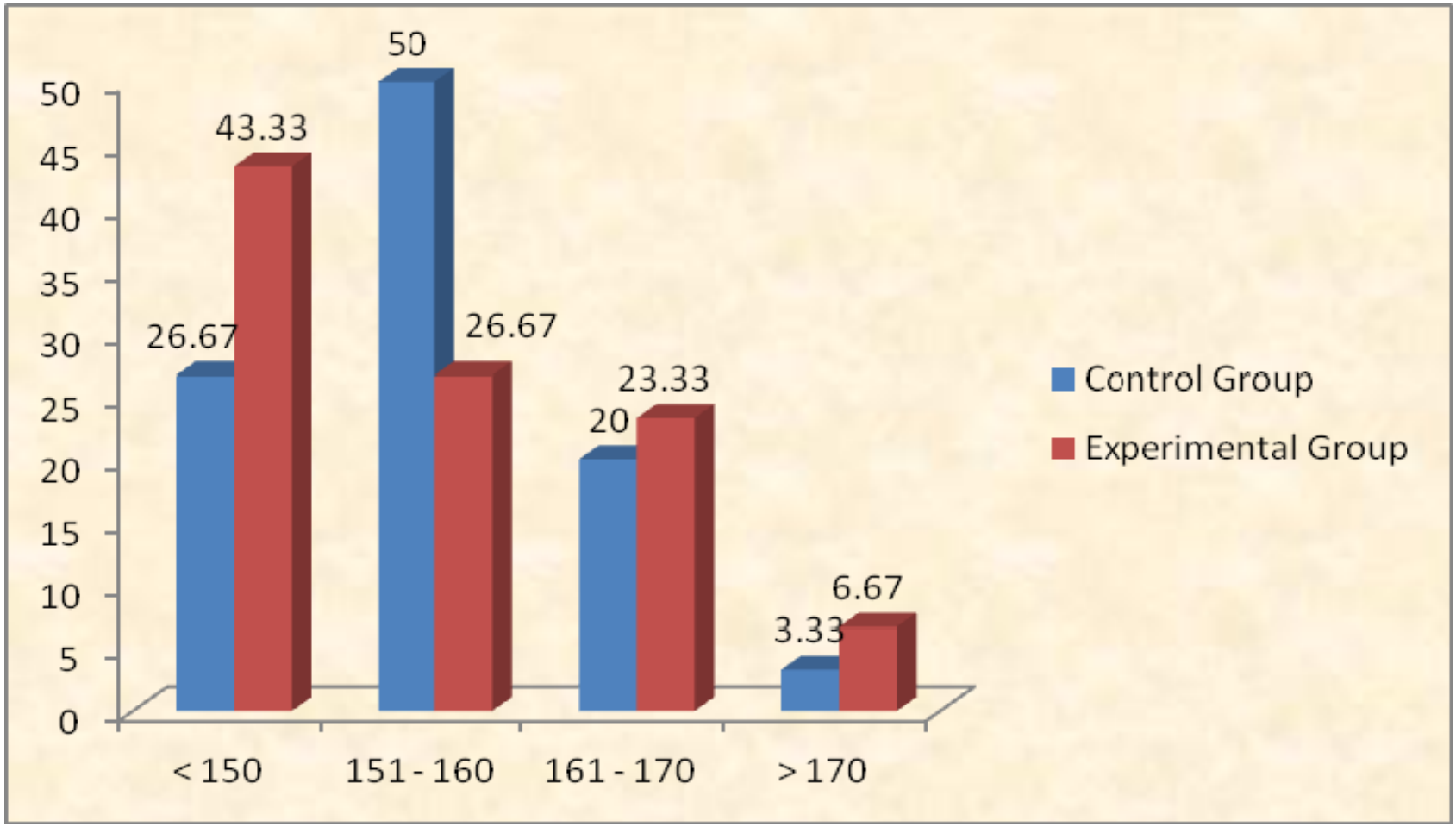

Fig. 4 Percentage Distribution of Height in Control and Experimental Group of Elderly Clients

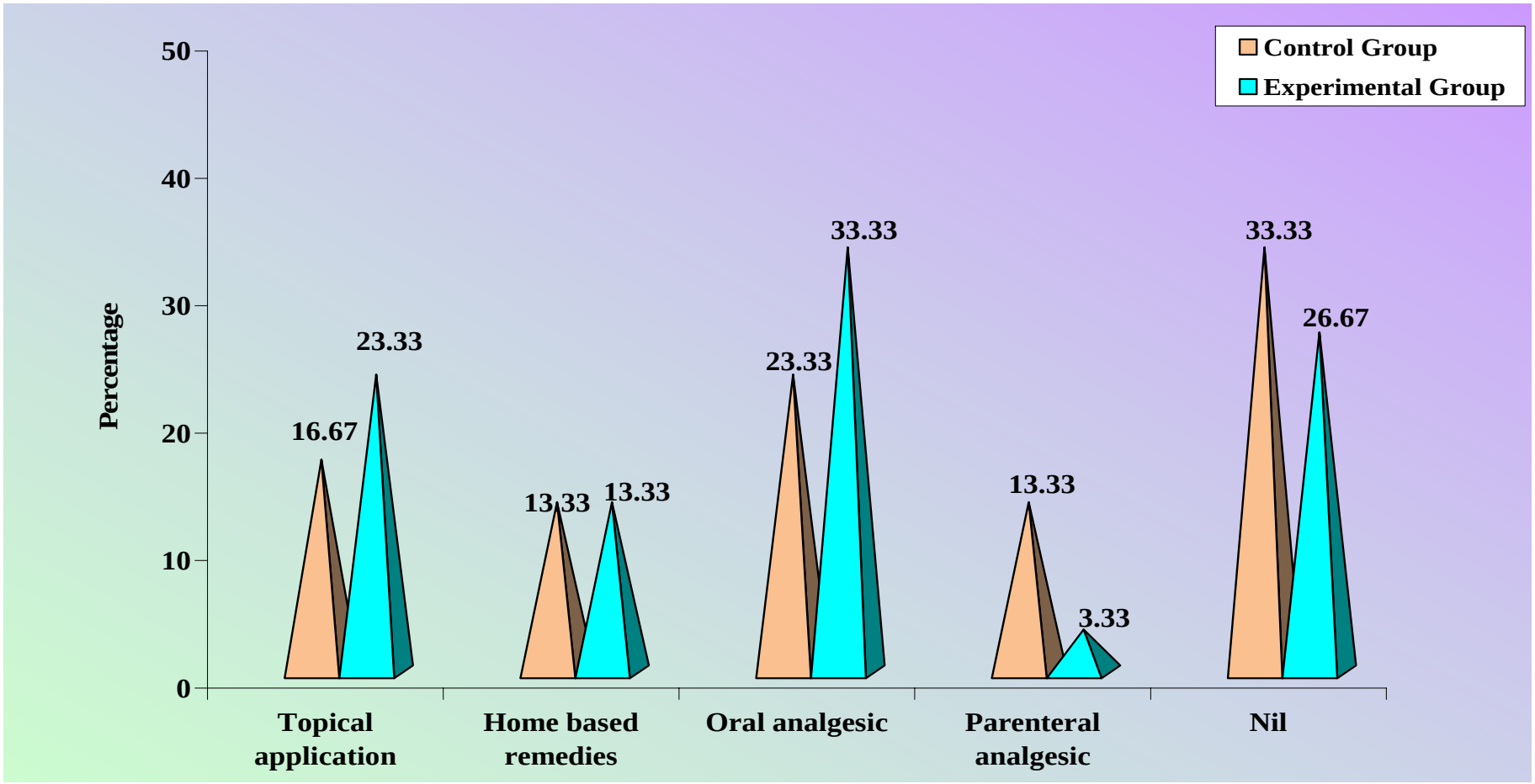

Fig. 5 Percentage Distribution of Treatment for Knee Joint Pain in Control and Experimental Group of Elderly Clients

Table 3

Frequency and Percentage Distribution of Level of Knee Joint Pain Before and after Mustard Plaster application in Control and Experimental Group of Elderly Clients.

Level of pain	Control group (n=30)		Experimental group (n=30)	
	n	p	n	p
Before application				
Mild	3	10	-	-
Moderate	15	50	14	46.67
Severe	12	40	16	53.33
After application				
Mild	5	16.67	13	43.33
Moderate	19	63.33	17	56.67
Severe	6	20	-	-

Table 3 denotes most of the elderly had severe pain (40%, 53.33%) before mustard plaster application in control and experimental group, whereas in the experimental group, significant percentage (43.33%) had mild pain after mustard plaster application.

Table 4

Frequency and Percentage Distribution of selected Signs and Symptoms of Knee Joint pain Before and After Mustard Plaster application in Control and Experimental group of Elderly clients.

Signs and symptoms	Control group (n=30)		Experimental group (n=30)	
	n	p	n	p
Before application				
Mild	12	40	12	40
Moderate	13	43.33	17	56.67
Severe	5	16.67	1	3.33
After application				-
Mild	13	43.33	22	73.33
Moderate	17	56.67	8	26.67

Table 4 reveals in this present study most of them had mild signs and symptoms (40%, 40%), moderate (43.33%, 56.67%) before mustard plaster application. Whereas after application of mustard plaster most of them had mild signs and symptoms (43.33%, 73.33%) in the control and experimental group respectively.

Table 5

Comparison of Mean and Standard Deviation of Level of knee joint pain between Control and Experimental group Before and After mustard plaster application of elderly clients.

Level of Pain	Control group (n=30)		Experimental group (n=30)		't' value
	Mean	SD	Mean	SD	
Before Application	5.38	1.64	6.37	1.13	-14.14
After Application	5.20	1.42	4.19	1.37	16.83***

***P<0.001

The table 5, inferred that the mean, standard deviation of knee joint pain level were same before and after in the control group (M = 5.83; SD =1.64) (M = 5.20; SD = 1.42) whereas in experimental group were less (M= 4.17; SD = 1.37) level comparison with before mustard plaster application was (M = 6.37; SD = 1.13) which indicates that mustard plaster is effective in reducing knee joint pain among elderly hence the null hypothesis Ho_1 was rejected.

Table 6

Comparison of Mean and Standard Deviation of knee joint pain signs and symptoms between Control and Experimental group Before and After mustard plaster application of elderly clients.

Signs and Symptoms	Control Group (n=30)		Experimental Group (n=30)		't' value
	Mean	SD	Mean	SD	
Before application	4.77	1.16	5.23	2.09	-6.5
After application	3.53	1.25	2.27	1.23	21***

***P<0.001

The table 6 depicts that the mean and standard deviation of signs and symptoms of elderly clients before mustard plaster application in control and experimental groups were inferred as (M = 4.77; SD = 1.16, M = 5.23; SD = 2.09). Whereas after application of mustard plaster the mean and standard deviation were in the experimental group (M= 2.27; SD=1.23) in comparison with the control group (M = 3.53; SD =1.25).The difference was found statistically significant at p <0.001 level of confidence and it attributed to the effectiveness of mustard plaster application.

Table 7

Domain Wise Frequency and Percentage Distribution of the Level of Satisfaction Regarding Mustard Plaster Application in Experimental Group of Elderly Clients

(N=30)

Domain	Highly Satisfied		Moderately Satisfied	
	n	p	n	p
Over all	12	40%	18	(60%)
Approach of the researcher	8	26.66%	9	30%
Related to mustard plaster Application	4	13.33%	9	30%

Table 7, inferred that significant percentage of the elderly are moderately satisfied related to researcher and mustard plaster application (30%,30%), and highly satisfied in the experimental group (26.66%,13.33%).

Table 8

Association between Selected Demographic Variables and Level of knee Joint Pain Before and After Mustard Plaster Application in Control Group of Elderly Clients.

(N=30)

Demographic Variables	Before Application				After Application			
	Mild n	Moderate n	Severe n	χ^2	Mild n	Moderate n	Severe n	χ^2
Age in years								
60 - 64	0	7	5		0	10	2	
65 - 70	1	3	6	6.837	1	6	3	10.010
71 - 75	2	5	1	(d.f = 4)	4	3	1	(d.f = 4)
Sex								
Male	0	5	2	2.050	0	5	2	1.259
Female	3	10	10	(d.f = 2)	5	14	4	(d.f = 2)
Educational Status								
Illiterate	2	7	8	1.222	4	8	5	4.784
Elementary / Middle school	1	8	4	(d.f = 2)	1	11	1	(d.f = 2)
Marital status								
Married	2	4	6	2.005	3	6	3	1.546
Widow/Widower	1	11	6	(d.f = 2)	2	13	3	(d.f = 2)

Dietary pattern								
Vegetarian	0	1	4	4.080	0	2	3	6.613
Non vegetarian	3	14	8	(d.f = 2)	5	17	3	(d.f = 2)
Religion								
Hindu	1	4	1	1.177	2	3	1	1.205
Christian	2	11	11	(d.f = 2)	3	16	5	(d.f = 2)
Family History of knee joint pain								
Yes	2	4	6	2.005	4	6	2	4.600
No	1	11	6	(d.f = 2)	1	13	4	(d.f = 2)
Previous occupation								
Heavy worker	0	7	8	4.004	1	10	4	2.915
Moderate worker	3	8	4	(d.f = 2)	4	9	2	(d.f = 2)

Table 8, depicts there was no significant association between demographic variables age, sex, religion, educational status, food pattern and level of knee joint pain before and after mustard plaster application in control group. Hence the null hypothesis Ho_2 was retained.

Table 9

Association between Selected Demographic Variables and Level of knee Joint Pain Level Before and After Mustard Plaster application in Experimental group of Elderly Clients.

(N=30)

Demographic Variables	Before Application			After Application		
	Moderate n	Severe n	χ^2	Mild n	Moderate n	χ^2
Age in years						
60 - 64	5	6		5	6	
65 - 70	6	6	0.101	4	8	1.052
71 - 75	3	4	(d.f = 2)	4	3	(d.f = 2)
Sex						
Male	7	7	0.117	6	8	0.002
Female	7	9	(d.f = 1)	**7**	**9**	(d.f = 1)
Educational Status						
Illiterate	7	9	0.117	7	9	0.002
Elementary / Middle school	7	7	(d.f = 1)	6	8	(d.f = 1)
Marital status						
Married	4	8		4	8	0.814
Single	2	0	3.214	1	1	(d.f = 2)
Widow/Widower	8	8	(d.f = 2)	8	8	
Dietary pattern						
Vegetarian	2	3	1.071	2	3	0.848
Non vegetarian	12	12	(d.f = 2)	11	13	(d.f = 2)
Ova vegetarian	0	1		0	1	
Religion						
Hindu	6	10	1.158	7	9	0.002
Christian	8	6	(d.f = 1)	6	8	(d.f = 1)
Family History						
Yes	3	6	0.918	3	6	0.524
No	11	10	(d.f = 1)	10	11	(d.f = 1)
Previous occupation						
Heavy worker	9	9	0.201	8	10	0.023
Moderate worker	5	7	(d.f = 1)	5	7	(d.f = 1)

Table 9, indicates that there was no significant association between age, religion, educational status, family history, dietary pattern, previous occupation before and after application of mustard plaster in experimental group. Hence the null hypothesis H_{02} was retained.

Table 10

Association between Selected Clinical Variables and Level of knee Joint Pain

Before and After Mustard plaster application in Control group of Elderly Clients.

(N=30)

Clinical variables	Before Application				After Application			
	Mild	Moderate	Severe		Mild	Moderate	Severe	
	n	n	n	χ^2	n	n	n	χ^2
Height in cms								
<150	2	5	1		1	9	4	
151 – 160	2	9	4		2	4	1	1.42
161 – 170	1	4	1	1.643	2	5	0	
>170	0	1	0	(df =4)	0	2	0	(df =4)
Weight in Kg								
51 - 60	1	6	2		5	2	2	
61 - 70	3	7	4	3.283	7	4	3	4.3
>70	1	6	0	(df =3)	-	7	0	(df =3)
Body Mass Index								
18.6 - 24.9	1	5	2		4	3	1	
25 - 29.9	3	6	3	2.377	5	4	3	3.76
>30	1	8	1	(df =3)	5	4	1	(df =3)
Presence of co morbid illness								
Hypertension	1	3	2		2	3	1	
Cardiovascular disease	0	0	1	8.67	0	1	0	10.32
Diabetic Mellitus	1	9	0		5	5	0	
Nil	3	7	3	(df =4)	7	3	3	(df =4)
Treatment of co morbid illness								
Yes	1	8	2	0.055	5	5	1	2.01
No	4	11	4	(df=2)	7	6	6	(df=2)
Is there a history of Knee trauma/ accident?								
Past	2	3	1	5.576	3	3	0	1.50
Not at all	3	16	5	(df=2)	9	10	5	(df=2)

Undergone Knee Surgeries								
Yes	1	4	1	1.23	3	3	0	7.56
No	4	15	5	(df=2)	15	5	4	(df=2)
Treatment for Knee joint pain								
Topical application	1	3	1		3	2	0	
Home based remedies	0	2	2		3	1	1	
Oral analgesic	2	5	0	8.56	3	3	1	10.23
Parenteral analgesic	0	3	1	(df=5)	2	0	2	(df=5)
Nil	2	6	2		7	1	2	
Follow regular exercise pattern								
Walking	3	5	1	2.23	5	4	0	2.98
None	2	14	5	(df=2)	8	7	6	(df=2)

Table 10 reveals that there was no significant association between clinical variables (Height, Weight, BMI, presence of co morbid illness, treatment for co morbid illness, exercise pattern) and level of knee joint pain before and after mustard plaster application in control group. Hence null hypothesis Ho_3 was retained.

Table 11

Association between Selected Clinical Variables and Level of knee Joint Pain Before and After Mustard Plaster Application in Experimental Group of Elderly Clients.

(N=30)

Clinical Variables	Before Application			After Application		
	Moderate	Severe	χ^2	Mild	Moderate	χ^2
	n	n		n	n	
Height in cms						
<150	6	7		6	7	
151 – 160	4	4	3.224	2	6	3.753
161 – 170	2	5	(d.f = 3)	3	4	(d.f = 3)
>170	2	0		2	0	
Weight in Kg						
<50	1	3		0	4	
51 – 60	2	3	1.215	2	3	3.878
61 - 70	7	7	(d.f = 3)	7	7	(d.f = 3)
>70	4	3		4	3	
Body Mass Index						
<18.5	0	1		0	1	
18.6 - 24.9	4	5	1.185	3	6	1.699
25 - 29.9	5	4	(d.f = 3)	4	5	(d.f = 3)
>30 kg	5	6		6	5	
Presence of co morbid illness						
Hypertension	2	7	4.107	2	7	4.661
Diabetic Mellitus	4	5	(d.f = 2)	3	6	(d.f = 2)
Nil	8	4		8	4	
Treatment of co morbid illness						
Yes	4	11	4.821	3	12	6.652
No	10	5	(d.f = 1)	10	5	(d.f = 1)
Is there a history of Knee trauma/ accident?						
Recent	2	0	2.578	1	1	0.271
Past	3	5	(d.f = 2)	4	4	(d.f = 2)
Not at all	9	11		8	12	

Undergone Knee Surgeries						
Yes	3	4	0.053	4	3	0.709
No	11	12	(d.f = 1)	9	14	(d.f = 1)
Treatment for Knee joint pain						
Topical application	2	5		3	4	
Home based remedies	1	3	5.175	1	3	2.555
Oral analgesic	5	5	(d.f = 4)	4	6	(d.f = 4)
Parental analgesic	0	1		0	1	
Nil	6	2		5	3	
Follow regular exercise pattern						
Walking	4	8		3	9	
Cycling	0	1	2.742	0	1	4.068
None	10	7	(d.f = 2)	10	7	(d.f = 2)

Table 11, illustrates that there is no significant association between clinical variables (Height, Weight, BMI, Presence of co morbid illness, treatment for co-morbid illness, exercise pattern) and level of joint pain before and after mustard plaster application in control group. Hence the null hypothesis Ho_3 is retained.

Summary

This chapter has dealt with analysis and interpretation of the data obtained by the researcher. The analysis showed effectiveness of the mustard plaster application. The mean and standard deviation of difference in joint pain level among elderly was statistically significant in the experimental before and after the application of mustard plaster.

Chapter V

Discussion

CHAPTER V

DISCUSSION

Statement of the Problem

An Experimental Study to assess the Effectiveness of Mustard Plaster Application upon Knee Joint Pain among Elderly Clients in Selected Community, Chennai.

Objectives of the Study

1. To assess the level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.
2. To determine the effectiveness of mustard plaster application by comparing the level of knee joint pain in the control and experimental group of elderly clients.
3. To determine the level of satisfaction in experimental group of elderly clients regarding application of mustard plaster.
4. To find the association between selected demographic variables and clinical variables and the level of knee joint pain in control and experimental group of elderly clients.

The discussion was presented under the following

- Demographic variables of the elderly clients with knee joint pain.
- Clinical variables of the elderly clients with knee joint pain.
- Level of knee joint pain and signs & symptoms of elderly clients.
- Mean and standard deviation of Level of knee joint pain and its signs and symptoms before and after mustard plaster application.

- The level of satisfaction regarding of mustard plaster application in experimental group of elderly clients.
- Association between the selected demographic variables and level of knee joint pain in the control and experimental group of elderly clients.
- Association between the selected clinical variables and level of knee joint pain in the control and experimental group of elderly clients.

Demographic variables of the elderly clients with knee joint pain.

Most of the participants were in the age group of 60-64years (40%, 36.67%), females (53.33%, 76.67%), illiterates (56.67%, 53.33%), married (40%, 40%) and majority of them were non vegetarians (83.33%, 80%), did not have family history of knee joint pain (60%, 70%), heavy workers (50%, 64%) in the control and experimental group respectively.

Since the ageing population is constantly growing globally their health is the greatest challenge to the health team, so specialized care has to be provided to them to prevent the age related functional disabilities. Thus paving way for the community health nurse to focus on dietary practices and exercise pattern. It emphasise the importance of concentrating on present generation to prevent knee joint pain at their older age.

The finding was correlated with the research conducted by Jack et al in which 480 men and women aged 65 years and older had knee joint pain on most days of the week. It also indicates the importance of focusing on this particular age group for future research in promoting their wellness thus improving the quality of life.

India is a developing country till now we have not yet attained full literacy rate in our country, even this has not reported in urban parts of the country. So the health teaching for the elderly should be at their level of understanding. Video shows, group talks, demonstration of exercises can be done to create awareness which brings about a change in the behaviour so that health status can be improved & the dependency ratio can be reduced. Irrespective of the family history there is need for imparting knowledge regarding knee joint pain.

According to a joint US Iranian study, combining exercise with Omega -3 supplements may boost the bone mineral density in older men and women. Omega – 3 available in fish, as most of the study participants are non vegetarians they can be encouraged to consume fish foods rather than going for meat products. Hence bone mineral density can be increased by modifying dietary pattern.

Most of elderly were heavy workers which depicts the working pattern may be a risk factor for the development of knee joint pain. This insists about proper body mechanisms at work and home may help to reduce the illness. It highlights the need of community health nurse to concentrate more on this age group to reduce the morbidity related to physical disability and pain in elderly clients through various strategies.

Clinical variables of the elderly clients with knee joint pain

Significant percentage of participants have body weight 61-70 kg (46.67%, 46.66%) with BMI >30 (33.33%, 36.67%), have no co morbid illness (43.33%, 40%). Most of them doesn’t take treatment for co-morbid illness (63.33%, 50%), do not follow any exercise pattern (70%, 56.67%) and majority of them have no history of knee

trauma/accidents (80%, 66.67%), not undergone knee surgeries (80%, 76.67%) in the control and experimental group respectively.

Weight is one of the modifiable risk factor for developing knee joint pain. This is supported by Toivanen et.al (2009) who found that the risk of developing knee pain was strongly associated with BMI (25-29), age, gender, and other co- variables as well as obesity, heavy work load and knee injury so, the importance of weight reduction has to be insisted & they should be encouraged to exercise regularly to prevent the development of knee joint pain..

The researcher concludes that the knee joint pain could be reduced if BMI is maintained at normal by making changes in dietary habits, regular exercise pattern. Community health nurse should educate regarding benefits of appropriate weight for height, to follow regular, simple exercise pattern through the home visit.

Pain is one of the chief complaints and it restricts the activity and causes severe discomfort, so it is the greatest responsibility of nurses to provide comfort to the clients. More than short term relief, long term relief is considered and hence mustard plaster application can be done for these clients since it is proved effective in reducing knee joint pain.

Level of knee joint pain and its signs and symptoms of elderly clients

The findings of the present study revealed that significant percentage of the elderly had severe pain before the mustard plaster application in the control and experimental group (40%, 53.33%) respectively. Most of them had moderate pain in

experimental group after mustard plaster application (56.66%). Majority of them in experimental group had mild signs and symptoms after mustard plaster application (73.33%) which was low before mustard plaster application (40%).

This finding is consistent with the research conducted by Mccarne et al (2000) which reveals the prevalence of painful disabling knee, of which one quarter severely disabled. The study suggested health care provision in primary care needs to focus on broader aspects on community levels of pain and disability.

The knee joint pain restricts the activities of the client. It is the duty of the health personnel to teach the care givers about the application of mustard plaster and its effects on health. Today the money spent on medicines is on raise and its side effects are also high. Mustard is naturally occurring plant product, cheap and with least side effects. It is effective in reducing knee joint pain hence it can be used safely in elderly clients.

Mean and standard deviation of level of knee joint pain and its signs & symptoms level before and after application of mustard plaster.

In the control group there was no significant difference in the knee joint pain level before (M = 5.83; SD =1.64) & after (M = 5.20; SD = 1.42), similarly the level of signs and symptoms also showed no difference before (M = 4.77; SD = 1.16) & after (M= 3.53; SD = 1.25) mustard plaster application. In contrast in the experimental group the joint pain levels (M=4.17; SD=1.37) & level of signs and symptoms (M=2.27; SD=1.27) after the therapy was low, compared to those before the therapy (M=6.37; SD=1.13) & (M=5.23; SD=2.09) respectively. The difference was found to be

statistically significant at essential for all those who are concerned to disseminate these findings so that evidence based knowledge can be utilized in the both clinical and community setting to reduce the knee joint pain level through the application of mustard plaster. The findings are consistent with the research conducted at kayalvarath health complex (2010) where it reported that mustard plaster application is effective in reducing knee joint pain among study participants.

It also reflects the need for the nursing personnel to concentrate on alternative and complementary therapy by which we can reduce the side effects induced by pharmacological management. It can enhance the independency level which gives a new confidence and challenge to face the life. Mustard is cheap and easily available to use it which has benefits in reducing the joint pain level.

The level of satisfaction regarding mustard plaster application in experimental group of elderly clients.

The researcher found that significant percentage of the elderly was highly satisfied (40%) and most of them were satisfied (60%) regarding the mustard plaster application. The findings revealed that the application of mustard plaster is effective in reducing the knee joint pain level. Since it is easily available, cost effective, and easy to apply, the community health nurse can be instrumental in the application of mustard plaster.

The study findings have given importance on alternative and complementary therapy. The government of India under national health policy 2002 has set objective on strengthening the complementary therapy. Every

community health nurse should aim to achieve the objective set by government in strengthening the complementary therapy.

Association between the selected demographic variables and level of knee joint pain of elderly clients.

In this present study investigator found that knee joint pain can affect all categories of clients irrespective of age, sex, marital status, education, occupation. There is no significant association between selected demographic variables and level of knee joint pain in the control and experimental group before and after the application of mustard plaster. Hence, null hypothesis Ho_2 was retained.

The findings were supported by the study conducted by Mccarne who identified that knee pain in community shares risk factors in common over 55 years. This reflects that knee joint pain is common even among 50 – 55 years of age irrespective of their demographic variables.

Association between the selected clinical variables and level of knee joint pain of elderly clients.

The investigator has found that there was no significant association between selected clinical variables and knee joint pain level before and after application of mustard plaster in the experimental group and control group. Hence the null hypothesis Ho_3 is retained.

This shows that clinical variables weight, body mass index, past history of knee joint pain, treatment for pain does not have any impact on knee joint pain. Further studies can be conducted to generalise the findings.

Summary

This chapter has dealt with the objectives of the study, findings of the demographic and clinical variables of the elderly with knee joint pain, description of severity of pain before and after application of mustard plaster and association between the demographic variables and clinical variables with severity of pain in the control and experimental group.

Chapter VI

Summary, Conclusion, Implications and Recommendations

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter deals with the summary, conclusion, implications and recommendations of the study "An Experimental Study to Assess the Effectiveness of Mustard Plaster Application upon Knee Joint Pain among Elderly Clients in Selected Community, Chennai."

Summary

The heart of the research project lies in reporting the findings. This is the most creative demanding part of the study. The aim of the study was to assess the effectiveness of mustard plaster upon knee joint pain among the elderly clients.

The Objectives of the Study

1. To assess the level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.
2. To determine the effectiveness of mustard plaster application by comparing the level of knee joint pain in the control and experimental group of elderly clients.
3. To determine the level of satisfaction in experimental group of elderly clients regarding application of mustard plaster.
4. To find the association between selected demographic variables and clinical variables and the level of knee joint pain in control and experimental group of elderly clients.

Null Hypotheses

Ho_1: There will be no significant difference in the level of knee joint pain before and after mustard plaster application in control and experimental group of elderly clients.

Ho_2: There will be no significant association between selected demographic variables and level of knee joint pain in control and experimental group of elderly clients.

Ho_3: There will be no significant association between clinical variables and level of knee joint pain in control and experimental group of elderly clients.

Conceptual framework of this study was based on Katharine Kolcab theory of comfort which was modified for the present study. An extensive review of literature and guidance by experts laid the foundation for the study. An experimental approach was adopted for the study, which was conducted at selected rural areas in Chennai at Ayanambakkam. The sample size was 60. Simple random sampling technique was chosen where lottering method was used to assign the subjects into control and experimental group.

The investigator used numerical pain rating scale, observational check list for signs and symptoms, rating scale to assess the level of satisfaction to collect data from the elderly clients. The data collection tools were validated and reliability was established. The data collection for the main study was done after determining the feasibility and practicability through pilot study. Mustard plaster (Paste made from 20 gms of mustard powder and 40 gms of wheat flour mixed with needed water, evenly spread in-between cloth) to both the knees over which hot water bag application given

for 15 minutes daily for a period of seven days to all the elderly clients with knee joint pain in the experimental group. The collected data were tabulated and analyzed using appropriate descriptive and inferential statistics.

The Major Findings of the Study

Demographic variables of elderly clients with knee joint pain

Most of the participants were in the age group of 60-64years (40%, 36.67%), females (53.33%, 76.67%), illiterates (56.67%, 53.33%), married (40%, 40%) and majority of them were non vegetarians (83.33%, 80%), did not have family history of knee joint pain(60%, 70%), heavy workers (50%, 64%) in the control and experimental group respectively.

Clinical variables of elderly clients

Significant percentage of participants have body weight 61-70 kg (46.67%, 46.66%) with BMI >30 (33.33%, 36.67%), have no co morbid illness (43.33%, 40%).Most of them doesn’t take treatment for co-morbid illness (63.33%, 50%), do not follow any exercise pattern (70%, 56.67%) and majority of them have no history of knee trauma/accidents (80%, 66.67%), not undergone knee surgeries (80%, 76.67%) in the control and experimental group respectively.

Level of knee joint pain and its signs and symptoms of elderly clients

The findings of the present study revealed that significant percentage of the elderly had severe pain before the mustard plaster application in the control and

experimental group (40%, 53.33%) respectively .Most of them had moderate pain in experimental group after mustard plaster application(56.66%).

Majority of them in experimental group had mild signs and symptoms after mustard plaster application (73.33%) which was low before mustard plaster application (40%).

Mean and standard deviation of level of knee joint pain and its signs & symptoms level before and after application of mustard plaster.

In the control group there was no significant difference in the knee joint pain level before (M = 5.83; SD =1.64) & after (M = 5.20; SD = 1.42), similarly the level of signs and symptoms also showed no difference before (M = 4.77; SD = 1.16) & after (M= 3.53; SD = 1.25) mustard plaster application. In contrast in the experimental group the joint pain levels (M=4.17; SD=1.37) & level of signs and symptoms (M=2.27; SD=1.27) after the therapy was low, compared to those before the therapy (M=6.37; SD=1.13) & (M=5.23; SD=2.09) respectively.

Association between selected demographic variables and the level of knee joint pain of elderly clients.

There was no significant association between selected demographic variables and the knee joint pain level among elderly in both the experimental and control groups. Hence the null hypothesis Ho_2 was retained.

Association between selected clinical variables and the level of knee joint pain of elderly clients.

There was no significant association between selected clinical variable and knee joint pain among elderly in both the experimental group and control group. So the null hypothesis Ho_3 was retained.

The level of satisfaction regarding mustard plaster application in experimental group of elderly clients.

Most of the elderly were moderately satisfied with mustard plaster application (60%) and significant percentages (40%) of them were highly satisfied.

Conclusion

The findings indicated that knee joint pain is one of the important problems among elderly who are facing all over the world. The mustard plaster application could be useful for the elderly to reduce pain. The excavated results supported that mustard plaster is one of best method to reduce the knee joint pain level among elderly.

Implications

The findings of the study has implication in different branches of nursing profession i.e. nursing practice, nursing education, nursing administration and nursing research. By assessing the effectiveness of mustard plaster application in reducing knee joint pain we got clear pictures regarding different steps to be taken in all these fields to improve the standard of nursing profession

Nursing practice

"Health is wealth" the proverb is applicable to all age group. In community many elderly are disabled & there is lack of activities of daily living due to knee joint pain. It was evident from the present study that mustard plaster application is effective in reducing knee joint pain. The therapy can also be implied in ortho- clinics, hospitals and primary health centres. The community health nurse can share her knowledge and experience to other in the health care industry thus promoting the use of such intervention of health care.

Nursing education

Nurse educators when planning for instructing students, should provide opportunities for students to gain knowledge in pain reduction methods. The study outlined the significance of alternative and complementary therapy. Nurse educators should check out suitable programme to educate the public and nurses on the importance of mustard plaster application to promote the quality of life. So the nursing students at all levels should be taught about pain management techniques which are cost effective to practice.

Nursing administration

With advanced technology and ever growing challenges of health care needs, community health nurse and administrators, have responsibility to provide nurses with continuing opportunities for adopting various pain reduction methods. To promote the quality of life and well being. This will enable the nurses to update their knowledge and

acquire special skills in managing pain. The nurse administrators could conduct programmes through which cost effective methods could be used in reduction of pain.

Nurse administrators should take adequate steps with growing bodies in formulating policies and protocol to emphasize on nursing care of elderly with the symptoms of knee joint pain, plan for manpower, money, material methods and time to conduct the programmes.

Nursing Research

There is need for intensive and extensive research in this area. It opens a big avenue for innovative methods of creating awareness, development of teaching material and setting up multimedia centres for teaching, creating awareness among the public regarding the pain reduction techniques, its benefits, health promoting properties and its availability. There is need for wide research in this area to generate more detail and specific data base and to provide much needed information for the consumers and providers. The findings should be disseminated through conferences, seminars, publications in professional, national, international journals and World Wide Web.

Recommendations

The same study could be conducted on

- A large sample for a longer duration to generalize the results.
- For age group between 40 -55 years
- To assess with other therapies.
- In urban and rural settings
- In different settings among various population groups.

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Appendices

PPENDIX I

LETTER SEEKING PERMISSION TO CONDUCT STUDY

Apollo College of Nursing
(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0145/11 19/03/2011

To

The Councilor,
Thiruverkadu Township,
Chennai- 77

Respected Sir / Madam,

Sub.: To request permission for research study – Reg.

Greetings! As part of the curriculum requirement our 2nd year M. Sc. (N) student Ms. S.Dhivya. has selected the following title for her research study.

"An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected wards in Thiruverkadu Township, Community, Chennai"

So I kindly request your good selves to permit her to use the resource materials for the above-mentioned candidate.

Thanking You,

Dr. LATHA VENKATESAN
PRINCIPAL

தலைவர்
திருவேற்காடு நகராட்சி
சென்னை-600 077.

IS/ISO 9001:2000

Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

APPENDIX II

ETHICAL COMMITEE LETTER

Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

22 June, 2011

To
Ms. S. Dhivya
1st – MSC (Nursing)
Dept. of Community Health
Apollo College of Nursing, Chennai
Tamil Nadu, India

Reg : An Experimental study to assess the effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in selected wards of Thiruverkadu township.

Sub: Your letter dated 9 June, 2011 for approval of the above referenced project and its related documents

Dear Ms. S. Dhivya

Ethics committee – Apollo Hospitals has received the following document submitted by you related to the conduct of the above – referenced study.

- Project "An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected wards of Thiruverkadu township"
- Study Performa
- Informed consent form

The above-mentioned documents have been reviewed and approved (through expedited review) by the Chairman, Vice-Chairman and Member Secretary at a specially convened meeting of the Ethics Committee. The study is hereby approved to be conducted by you in the presented form

The following Ethics Committee members were present at the meeting held on 22 June, 2011

Name	Profession	Position in the committee
Mr. S. S. Narayanan	Ethicist	Chairman
Dr.Radha Rajagopalan	Clinician	Vice - Chairman
Dr. Jayanthi Swaminathan	Sr.GM Clinical & Collaborative Research	Member Secretary

Apollo Hospitals Enterprise Limited
21, Greams Lane, Off Greams Road, Chennai - 600 006
Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449
E - Mail : ecapollochennai@gmail.com

Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

Yours sincerely,

Radhakrishnan

Date 29/6/11

Dr. Radha Rajagopalan
Ethics Committee – Vice Chairman
Apollo Hospitals, Chennai

DR. RADHA RAJAGOPALAN
Vice Chairman
Ethics Committee
Apollo Hospitals Enterprise Limited
Chennai-600 006 Tamil Nadu

Apollo Hospitals Enterprise Limited
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E - Mail : ecapollochennai@gmail.com

APPENDIX III

PLAGIARISM ORIGINALITY REPORT

Plagiarism Detector - Originality Report

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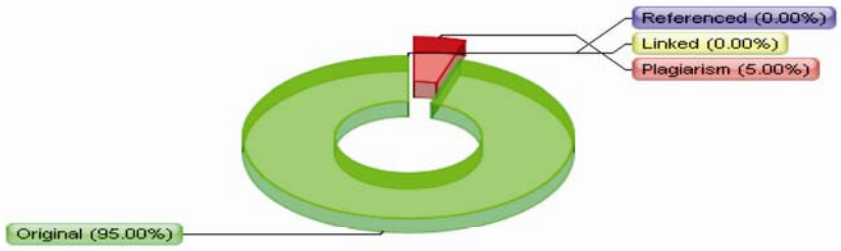

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Referenced 0% / Linked 0%

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APPENDIX IV

REQUEST FOR CONTENT VALIDITY

LETTER REQUESTING OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF RESEARCH

From

Ms. S.Dhivya
M.Sc., (Nursing) II year,
Apollo College of Nursing,
Chennai-95.

To

Dr.Latha Venkatesan,
Principal,
Apollo College of Nursing.

Through Proper Channel

Sub: Request for opinions and suggestions of expert for establishing content validity of

Respected tool.

Respected Madam,

Greetings! As a part of the Curriculum Requirement the following research title is selected for the study**"**

"An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected Community, Chennai"

I will be highly privileged to have your valuable suggestions with regard to the establishment of content validity of Research tool. So I request you to validate my Research tool and give suggestions about the tool.

Thanking you,

Yours Sincerely,

(Ms.S.DHIVYA)

Place:
Date:

APPENDIX V

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the research tool of Ms.DHIVYA.S, M.Sc. (Nursing) student who is undertaking research study on **"An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected Community, Chennai"**

Signature of Expert

Name and Designation

APPENDIX VI

LIST OF EXPERTS FOR CONTENT VALIDITY OF THE TOOL

Dr. Latha Venkatesan, M.Sc., M.Phil., Ph.D.,
Principal,
Apollo College of Nursing,
Chennai – 95.

Dr. R.Gopal Krishnan,M.S(Ortho)Mch(Ortho);L.Pool
SeniorConsultant,
Apollo Hospitals,
Chennai –06.

Prof. Mrs. Lizy Sonia.A,M.Sc (N).,
Vice Principal,
Apollo College of Nursing,
Chennai – 95.

Mrs. Shobana.G,M.Sc (N).,
Professor,
Apollo College of Nursing,
Chennai – 95.

Ms.Jaslina Gnana Rani.J , M.Sc (N).,
Professor,
Apollo College of Nursing,
Chennai – 95.

Ms.Sasikala. D,Msc(N).,
Assistant professor,
Apollo College of Nursing,
Chennai-95

Ms. Helen.M, M.Sc (N).,
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APPENDIX VII

RESEARCH PARTICIPANT CONSENT FORM

Dear participant,

I am a M.Sc., Nursing student of Apollo College of Nursing, Chennai. As part of my study, a research on "**Effectiveness of Mustard Plaster on Knee Joint Pain Among Elderly Clients".** The findings of the study will be helpful in reducing the knee joint for elderly with knee joint pain

I hereby seek your consent and co-operation to participate in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I ……. Hereby consent to participate and undergo the study

Place:

Date:

Signature of the participant

APPENDIX VIII

CERTIFICATE FOR ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation **““An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected Community, Chennai” by** Ms. Dhivya.S M.Sc. (Nursing) student, Apollo College of Nursing, was edited for English Language appropriateness.

Signature

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Vellore - 632001.

APPENDIX IX

CERTIFICATE FOR TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify the dissertation **"An Experimental Study to Assess the Effectiveness of Mustard Plaster Application on Knee Joint Pain Among Elderly Clients in Selected Community, Chennai"** by Dhivya.S M.Sc. (Nursing) student, Apollo College of Nursing, was edited for Tamil Language appropriateness.

Signature

S. VALARNILA, M.A., B.Ed.,
SCHOOL ASSISTANT
JAIGOPAL GARODIA GOVT.
HR. SEC. SCHOOL,
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APPENDIX X

DEMOGRAPHIC VARIABLE PROFOMA OF ELDERLY CLIENTS WITH KNEE JOINT PAIN

Purpose

This proforma is used to measure the demographic variables such as age, sex, education level, marital status, dietary pattern, religion, family history, occupation.

Instruction

The investigator will collect data by interviewing the elderly clients.

Identification Date

Sample No

1. Age in years

1.1 60-64 ☐

1.2 65-70 ☐

1.3 71-75 ☐

2. Sex

2.1 Male ☐

2.2 Female. ☐

3. Educational Status

3.1 Illiterate ☐

3.2Elementary ☐

3.3 middle school ☐

3.4 high school and higher secondary ☐

3.5 certificate courses ☐

3.6 graduate / post graduate ☐

4. Marital Status

4.1 Married ☐

4.2 Single ☐

4.3 Divorced ☐

4.4 Widow/ widower ☐

5. Dietary Pattern

5.1 Vegetarian ☐

5.2 Non Vegetarian ☐

5.3 Ova Vegetarian ☐

6. Religion

6.1 Hindu ☐

6.2 Christian ☐

6.3 Muslim ☐

6.4 Others ☐

7 Family history of knee joint pain

7.1 yes ☐

7.2 No ☐

8. Previous occupation

8.1 Heavy worker ☐

8.2 Moderate worker ☐

8.3 Sedentary worker ☐

,izg;G X

R%f kw;Wk; FLk;g tptuq;fspd; khWgl;lf; Fwpg;Gfis mwpAk; khjpupg;gbtk;

Nehf;fk;

,e;j khjpupg; gbtkhdJ cq;fs; r%f kw;Wk; FLk;g tptuq;fspd; khWg;gl;lf; Fwpg;Gfshd taJ> ghy;> fy;tpj;jFjp> jpUkzj; jFjp> czT Kiw> kjk; kw;Wk; FLk;g tuyhW Mfpatw;iw mstplg;gad; gLj;jg;gLfpwJ.

mwpTWj;jy;

jaT$h;e;J gjpy; mspg;gjpy; ntspg;gilahf ,Uf;fTk;

milahsk; fhzg;gl;l Njjp:

khjpup vz;:

1. taJ

1.1 60-64 ☐

1.2 65-70 ☐

1.3 71-75 ☐

2. ghy;

2.1 Mz; ☐

2.2 ngz; ☐

3. fy;tpj; jFjp ☐

3.1 Muk;gf; fy;tp ☐

3.2 eLepiyf; fy;tp ☐

3.3 cau; epiy kw;Wk; Nky; epiyf; fy;tp ☐

3.4 rhd;wpjo;g; gbg;Gfs;

3.5 ,sepiy / KJepiyg; gl;lk;

4. jpUkzj; jFjp

4.1 jpUkzkhdtu;

4.2 jdp egu;

4.3 tpthfuj;J Mdtu;

4.4 tpjit / kidtpia ,oe;jtu;

5. czT Kiw

5.1 irtk;

5.2 mirtk;

6. kjk;

6.1 ,e;J

6.2 fpwpj;Jtu;

6.3 ,];yhkpau;

6.4 gpw kjj;jpdu;

7. FLk;g tuthW

7.1 Mk;

7.2 ,y;iy

8. Ke;ija Ntiy

8.1 fbd Ntiyf;fhuh;

8.2 kpjkhd Ntiyf;fhuh;

8.3 RWRWg;gw;w Ntiyf;fhuu;

APPENDIX XI

CLINICAL VARIABLE PROFOMA OF ELDERLY CLIENTS WITH KNEE JOINT PAIN

Purpose

This proforma is used to assess the clinical variables such as height, weight, BMI, co-morbid illness, exercise pattern of client.

Instruction

The researcher will collect some of the information from participants by asking question in the interview form. The researcher will obtain the consent from the client and assure the client that the data gathered will be kept confidential and anonymity will be maintained.

1. **Height in Cms**

   1.1 <150 ☐

   1.2 151-160 ☐

   1.3 161-170 ☐

   1.4 >170 ☐

2. **Weight in Kg**

   2.1 <50kg ☐

   2.2 51-60kg ☐

   2.3 61-70kg ☐

   2.4 >70 kg ☐

3. Body mass index

3.1 <18.5 ☐

3.2 18.6 – 24.9 ☐

3.3 25-29.9 ☐

3.4 >30 ☐

4. Presence of co-morbid illness

4.1 Hypertension ☐

4.2 Cardiovascular disease ☐

4.3 Diabetic mellitus ☐

4.4 Others ☐

4.5 Nil ☐

5. Treatment for co-morbid illness

5.1 Yes (if yes specify) ☐

5.2 No ☐

6. Is there a history of knee trauma/ accident?

6.1 Recent ☐

6.2 Past ☐

6.3 Not at all ☐

7. Did you undergo any knee surgeries in past?

7.1 Yes ☐

7.2 No ☐

8. Treatment for knee joint pain

8.1 Topical application ☐

8.2 Home based remedies ☐

8.3 Oral analgesic ☐

8.4 Parental analgesic ☐

8.5 Nil ☐

9. Do you follow a regular exercise pattern?

9.1 Walking ☐

9.2 Cycling ☐

9.3 None ☐

APPENDIX XII

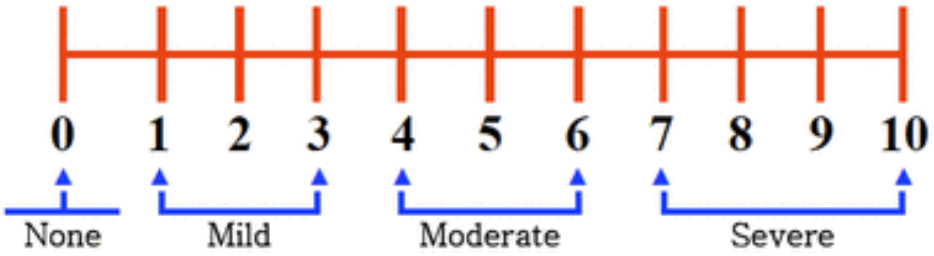
NUMERIC PAIN RATING SCALE

Purpose

The numeric pain rating scale is used to assess the level of pain experienced by the elderly client.

Instructions

- Please circle the number, which denotes the level of pain experienced by you.



Scoring of Pain

Score	Level of pain
0	No pain
1-3	Mild pain
4-6	Moderate pain
7-10	Severe pain

APPENDIX XIII

OBSERVATIONAL CHECK LIST ON ASSESSMENT OF SIGNS AND SYMPTOMS OF KNEE JOINT PAIN

Purpose

This observational check list is designed to assess the signs and symptoms of knee joint pain among elderly clients.

Instruction

The investigator will ask the study participants about sign and symptoms; if it is "yes" or "no" in the corresponding column

S.No	Signs and Symptoms	Before		After	
		Yes	No	Yes	No
1	Joint pain at rest				
2	Swelling				
3	Warmth				
4	Tenderness				
5	Pain increases on getting up, stair case, walking				
6	Restless most of time due to knee joint pain				
7	Do you fell increasing pain early morning and at night time				

8	Do you have insomnia due to knee joint pain				
9	Do you have severe joint pain while folding knees				
10	Do you have giddiness due to knee pain				

Scoring key

Yes - 1

No - 0

Score Interpretation	Level of signs and symptoms
0	No
1-3	Mild
4-6	Moderate
7-10	Severe

BLUE PRINT FOR RATING SCALE TO ASSESS THE LEVEL OF SATISFACTION IN EXPERIMENTAL GROUP REGARDING MUSTARD PLASTER APPLICATION

S.No	Content	Items	Total	Percentage (%)
1.	Questions related to approach of the researcher	1,2,3,4,5	20	50
2.	Questions related to regarding mustard plaster	6,7,8,9,10	20	50
			40	100

APPENDIX XIV

RATING SCALE TO ASSESS THE LEVEL OF SATISFACTION IN EXPERIMENTAL GROUP REGARDING MUSTARD PLASTER APPLICATION

Purpose

To assess the level of satisfaction of experimental group regarding mustard plaster application and its effectiveness.

Instruction

There are 10 items given below. Kindly read the items. Response extends from highly satisfied, moderately satisfied, satisfied, and dissatisfied. Put a tick mark against your answer

S.NO	ITEMS	HIGHLY SATISFIED	SATISFIED	DIS SATISFIED	HIGHLY DISSATISFIED
1	Explanation regarding mustard plaster				
2	Approach of the researcher				
3	Time spend by the researcher				
4	Duration of the mustard plaster application				

5	Arrangement of the articles during procedure				
6	Comfortable with temperature of hot water				
7	Position during application				
8	Satisfied and feels relaxed with mustard plaster.				
9	Satisfied with pain relief.				
10	Negligible side effect.				

Scoring Key

Highly satisfied - 4

Satisfied -3

Dissatisfied - 2

Highly dissatisfied - 1

Scoring Interpretation	**Percentage**
Highly satisfied	76-100%
Satisfied	50-75%
Dissatisfied	25-49%
Highly dissatisfied.	Below 25%

fLF xl;Lg;girg; gw;wpa ju msTNfhs;

Nehf;fk;

Nrhjidf; FOtpy; cs;stu;fSf;Ff; fLF xl;Lg;giriag; gad;g;gLj;jp mjdhy; fpilf;Fk; khw;wj;jpd; jpUg;jpia mstpl.

mwpTiu

fPNo gj;J tiffs; nfhLf;fg;gl;Ls;sd. jaTf;$u;e;J mtw;iwg; gbf;fTk;. gjpy;fs; kpFe;jj; jpUg;jp> msthdj; jpUg;jp> jpUg;jp kw;Wk; jpUg;jp ,y;iy vd mlq;Fk;. Cq;fspd; gjpypd; vjpNu nra;aTk;.

t.vz;	**tiffs;**	**jpUg;jp**	**Mjpfj; jpUg;jp**	**jpUg;jp apd;ik**	**Mjpfj; jpUg;jp apd;ik**
1.	fLF xl;Lg;girg; gw;wpa tpsf;fk;				
2.	Muha;r;rpahsupd; mZFKiw				
3.	Muha;r;rpahsu; nrytopj;j Neuk;				
4.	fLF xl;Lg;girg; Nghl;ljpd; fhy msT				
5.	nra;Kiwapd;nghOJ nghUl;fis itj;jpUe;j Kiw				
6.	jz;zPupd; ntl;g epiyap;d; trjp				

7.	girg; NghLk; nghOJ ,Ue;j epiy				
8.	fLF xl;L;g;girapy; %yk; fpilj;j jpUg;jpAk;				
9.	typ epthuzj;jpypUe;Jf; fpilj;j jpUg;jp				
10.	ftiyaw;wg; gf;f tpisT				

kjpg;ngz;

kpFe;jj; jpUg;jp - 4

jpUg;jp - 3

jpUg;jp ,y;iy - 2

kpFe;jj; jpUg;jp ,y;iy - 1

APPENDIX XV

DATA CODE SHEET

AGE – Age in years

1. 60-64
2. 56-70
3. 71-75

SEX

1. Male
2. Female

EDU- Educational Level

1. Illiterate
2. Elementary
3. Middle School
4. High School & Higher Secondary
5. Certificate Course

MS-Marital Status

1. Married
2. Single
3. Divorced
4. Widow & Widower

DP- Dietary Pattern

1. Vegetarian
2. Non Vegetarian
3. Ova Vegetarian

REL - Religion

1. Hindu
2. Christian
3. Muslim
4. Others

FH-Family History of Knee Joint Pain

1. Yes
2. No

PO- Previous Occupation

1. Heavy Worker
2. Moderate Worker
3. Sedentary Worker

HT- Height

1. 150
2. 151-160
3. 160-170
4. > 170

WT – Weight

1. <50
2. 51-60
3. 61-70
4. >70

BMI- Body Mass Index

1. <18.4
2. 18.5-22.5
3. 22.6-29.5
4. >30

PCL – Presents of Co morbid illness

1. Hypertension
2. Cardio Vascular Disease
3. Diabetic Mellitus
4. Others
5. Nil

TCI- Treatment for Co morbid illness

1. Yes
2. No

HTA- History of Knee Trauma / Accident

1. Recent
2. Past
3. Not at all

ASP- Any knee Surgeries in Past

1. Yes
2. No

TJP- Treatment for Joint Pain

1. Topical Application
2. Home based remedies
3. Oral Analgesic
4. Parental Analgesic
5. Nil

REP- Regular Exercise Pattern

1. Walking
2. Cycling
3. None

LOS-Level of satisfaction

APPENDIX XV

MASTER CODE SHEET

S.NO	DEMOGRAPHIC VARIABLES								CLINICAL VARIABLES									PAIN SCORE		LOS
	AGE	SEX	EDU	MS	DP	REL	FH	PO	HT	WT	BMI	PCL	TCI	HTA	ASP	TJP	REP	BEFORE	AFTER	
1	2	2	1	4	2	1	2	1	2	3	3	5	2	3	2	3	3	6	3	32
2	1	2	1	1	2	1	1	1	3	3	3	3	1	3	2	1	3	7	5	30
3	2	2	1	1	2	1	2	2	1	3	4	1	1	3	2	2	1	7	6	28
4	1	2	1	4	2	2	2	2	1	3	4	5	2	3	2	3	1	5	3	36
5	1	2	2	4	2	2	2	2	4	3	3	5	2	3	2	1	3	4	3	24
6	1	2	2	4	2	2	2	2	3	3	3	5	2	3	2	2	3	5	2	36
7	2	2	1	4	2	2	2	1	1	2	2	1	1	2	2	3	1	7	5	32
8	3	1	1	4	2	1	2	1	3	2	2	1	1	3	2	2	3	7	5	36
9	3	2	1	4	2	1	1	1	1	3	4	3	1	3	2	2	1	8	6	28
10	2	1	2	1	2	2	1	2	3	4	4	3	1	3	2	1	1	7	5	23
11	3	1	1	2	2	1	2	1	3	4	4	5	2	3	1	1	3	6	3	30
12	1	1	1	1	1	1	1	2	1	2	2	5	2	2	1	1	3	7	3	36
13	2	1	2	2	1	2	2	2	1	2	2	5	1	1	2	5	3	6	5	28
14	3	2	2	4	2	1	1	1	2	3	3	5	2	3	2	4	3	8	6	32
15	1	2	2	1	2	1	1	2	3	3	3	1	1	3	2	1	1	7	4	26
16	2	1	1	4	1	1	1	1	1	3	4	3	1	5	2	5	3	6	3	36
17	1	2	1	4	2	2	2	2	2	1	1	3	1	3	1	5	3	7	5	30
18	1	2	1	1	2	2	2	1	2	1	2	3	1	2	2	3	1	6	5	30
19	3	2	2	1	2	1	2	1	3	4	4	1	1	2	1	3	3	7	3	34
20	2	1	2	1	1	2	2	1	1	3	4	5	2	3	2	1	1	7	6	24
21	3	1	1	4	2	2	2	1	1	2	2	5	2	3	2	5	3	5	2	28
22	1	1	1	4	3	1	2	2	1	3	4	3	1	3	2	5	1	7	6	21
23	2	1	2	1	2	2	2	1	4	4	3	1	1	3	2	5	3	6	2	36
24	2	2	2	4	2	1	2	1	1	3	4	5	2	1	1	5	3	5	3	28
25	1	1	1	1	2	1	1	1	1	3	4	3	2	3	2	5	1	4	3	24
26	3	2	2	4	2	2	2	2	2	4	2	3	2	2	2	3	1	5	3	30
27	2	2	1	1	2	2	2	2	1	1	2	1	2	3	2	3	2	8	6	32
28	1	1	2	4	2	1	2	1	2	1	2	1	1	2	1	3	1	7	5	24
29	2	1	2	1	2	1	1	1	2	4	3	1	2	3	1	3	3	6	5	28
30	2	1	2	4	1	2	2	1	2	4	3	5	2	2	2	3	3	8	4	32

S.NO	DEMOGRAPHIC VARIABLES								CLINICAL VARIABLES									PAIN SCORE	
	AGE	SEX	EDU	MS	DP	REL	FH	PO	HT	WT	BMI	PCL	TCI	HTA	ASP	TJP	REP	BEFORE	AFTER
1	1	2	2	4	2	2	2	2	1	2	2	5	2	3	2	1	3	7	6
2	3	2	1	4	2	1	1	1	2	3	3	5	2	3	2	3	3	5	3
3	2	1	2	4	1	2	1	2	3	3	3	1	1	3	2	1	1	8	7
4	2	2	1	1	2	2	2	1	3	2	4	3	2	2	2	5	3	7	6
5	1	1	1	4	2	2	2	2	1	3	2	2	1	3	2	2	3	8	7
6	1	2	1	1	2	2	2	1	2	3	2	1	2	3	2	4	3	7	7
7	1	2	2	1	2	2	2	2	1	4	4	3	1	3	2	1	3	5	4
8	1	1	2	4	2	2	2	2	3	2	2	3	2	3	2	3	3	4	4
9	3	2	1	4	2	2	2	1	2	2	4	5	2	3	2	5	3	6	7
10	2	1	2	4	2	2	2	2	1	3	4	5	2	3	2	4	1	6	6
11	1	1	1	1	2	2	2	2	4	2	3	1	2	3	2	3	3	5	4
12	1	2	2	4	2	2	1	1	2	4	3	3	1	3	2	3	3	5	5
13	2	1	2	4	2	2	2	1	2	3	3	3	1	2	1	4	3	6	6
14	3	2	1	4	2	2	1	2	1	4	2	3	1	3	2	5	3	8	6
15	3	2	1	1	2	2	1	2	1	3	2	1	2	3	2	5	1	3	3
16	3	2	1	1	2	2	1	2	2	3	3	5	2	2	1	5	3	4	3
17	1	2	1	1	2	2	2	1	3	2	4	3	2	3	1	2	1	8	6
18	2	2	2	4	2	2	1	1	2	2	2	5	2	2	2	2	3	7	5
19	2	2	1	4	2	1	1	1	3	3	3	3	1	3	2	3	1	4	4
20	3	2	1	1	2	2	1	2	3	4	3	5	2	2	2	3	1	3	3
21	2	2	1	1	1	2	1	1	2	2	3	5	2	3	1	2	3	7	7
22	2	2	1	1	1	1	2	1	2	3	3	5	2	2	2	5	3	8	7
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26	2	2	2	4	2	1	2	2	1	2	4	3	1	3	2	1	1	3	3
27	1	2	1	4	2	2	2	2	2	4	4	5	2	3	2	1	3	6	6
28	1	2	2	1	1	1	2	2	2	4	4	5	2	3	2	5	3	5	4
29	1	2	1	1	1	2	1	1	2	4	4	3	1	3	2	4	1	8	6
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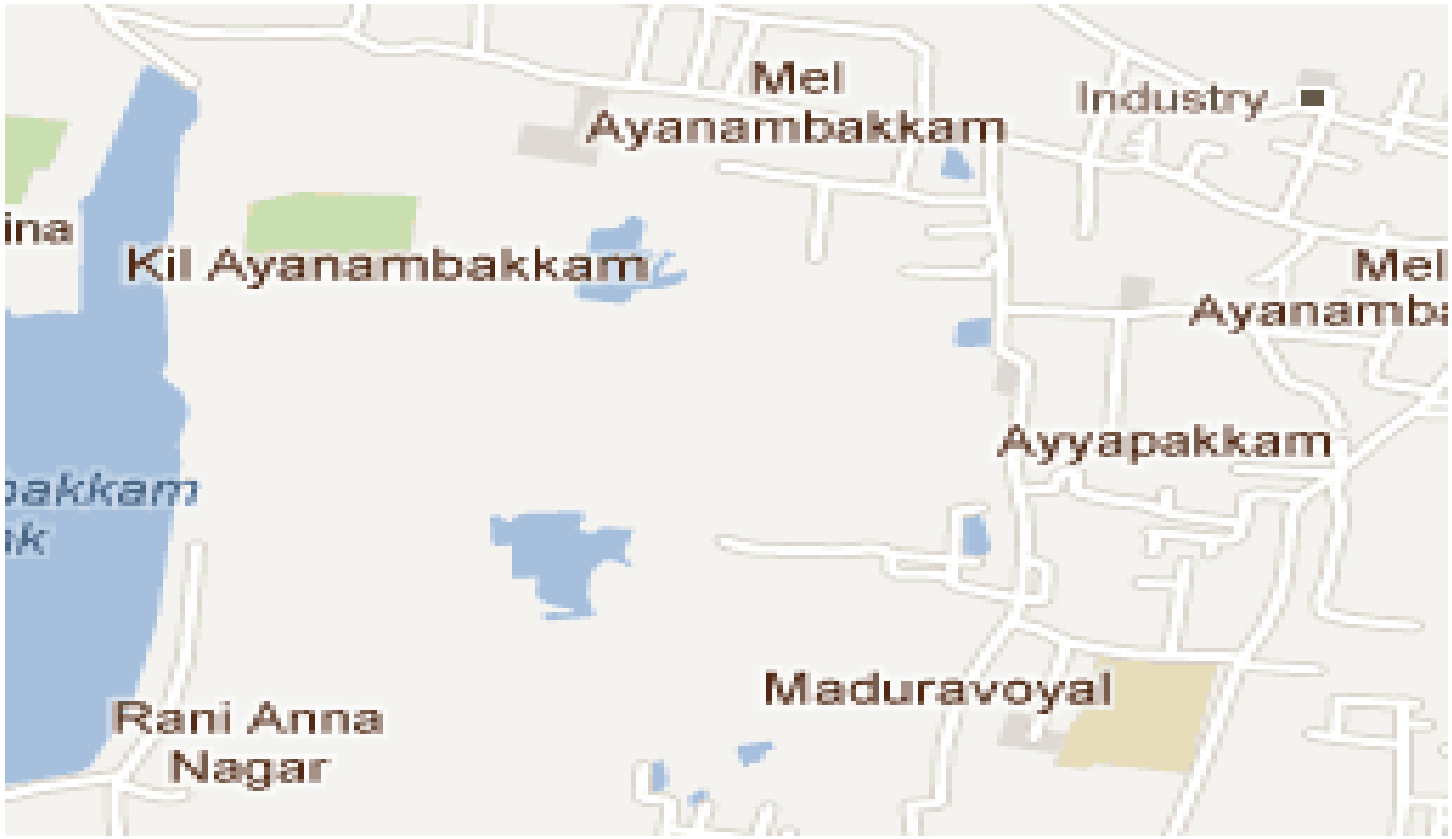
APPENDIX XVI

AREA MAP



Steps in mustard plaster application